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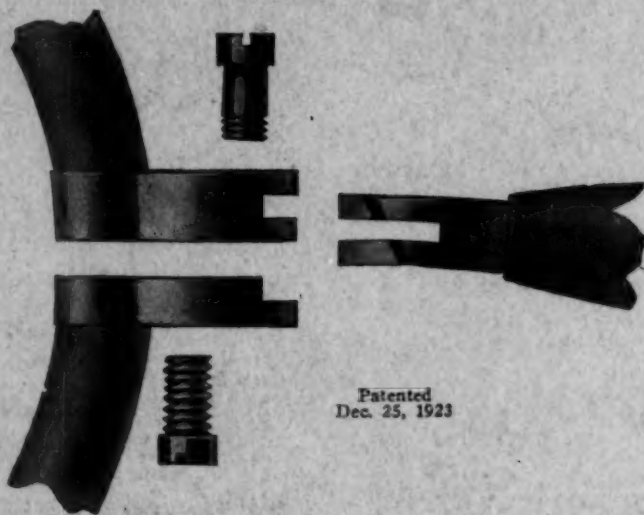
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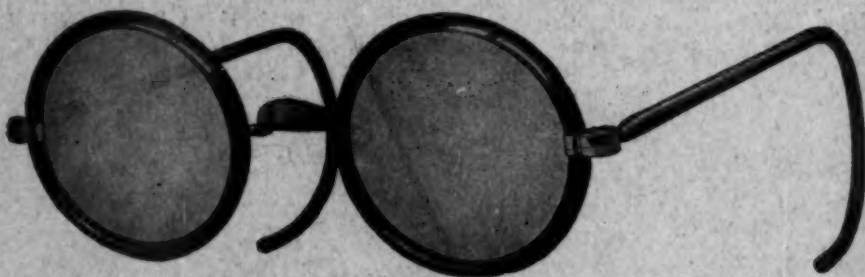


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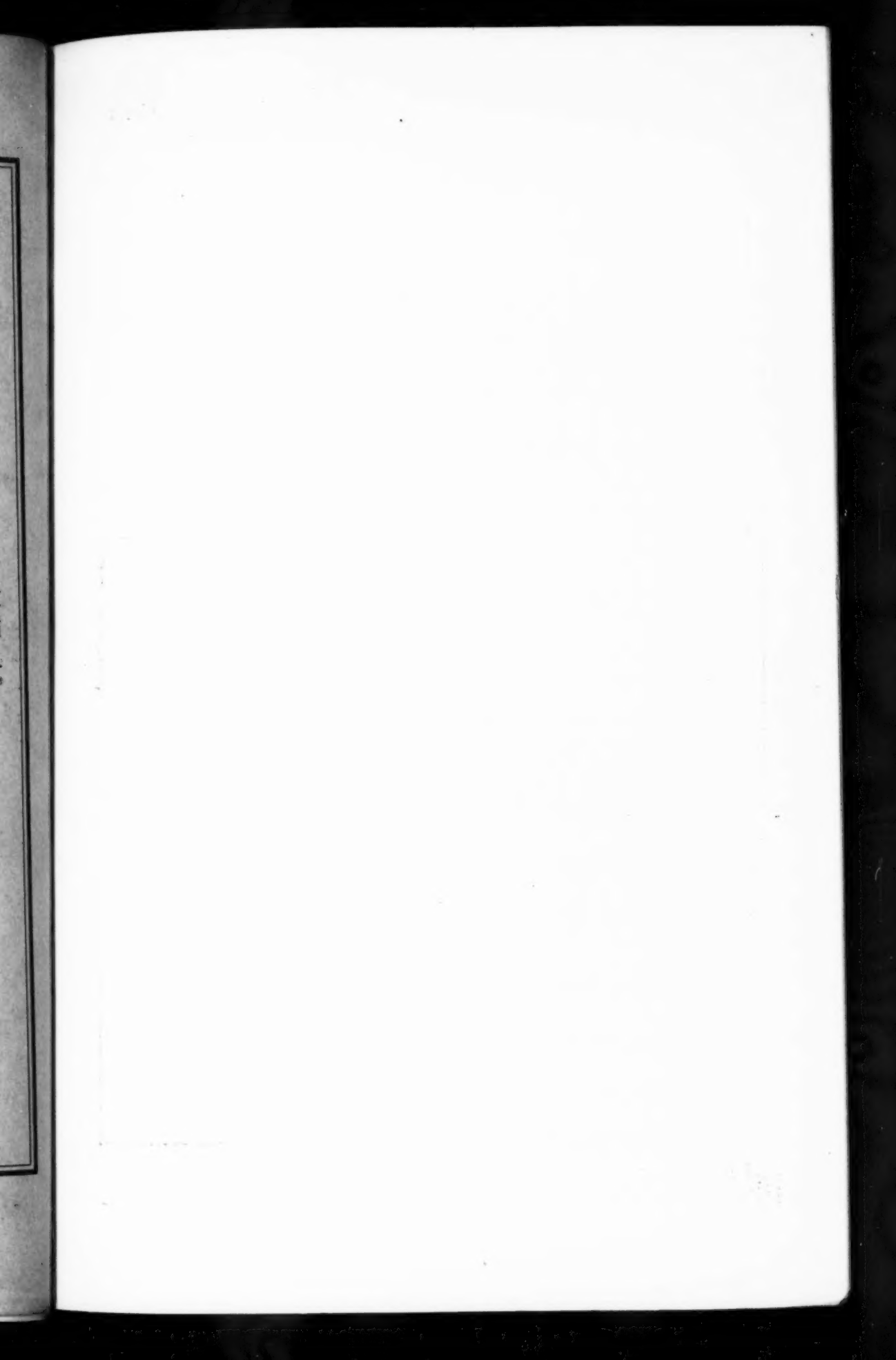
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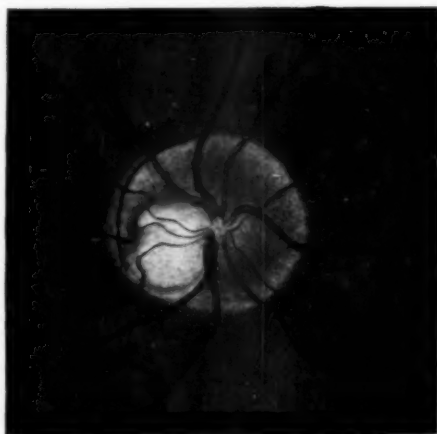
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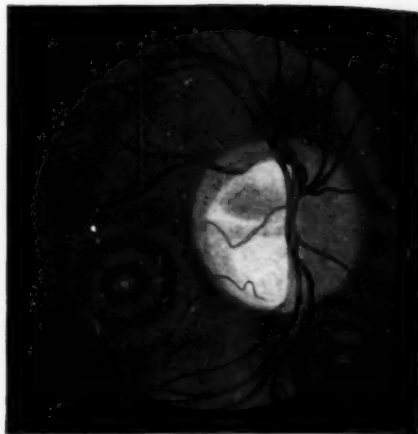
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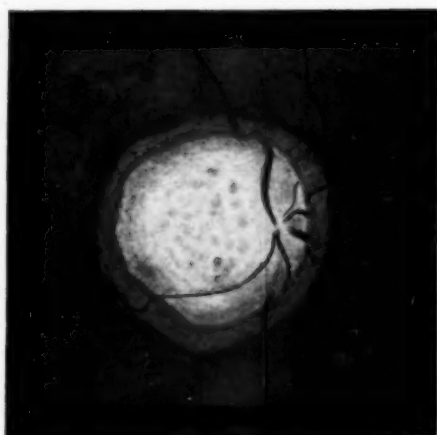




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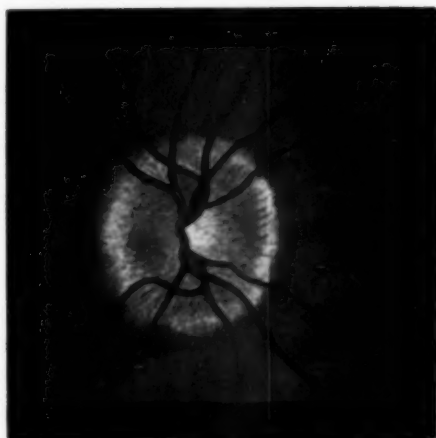
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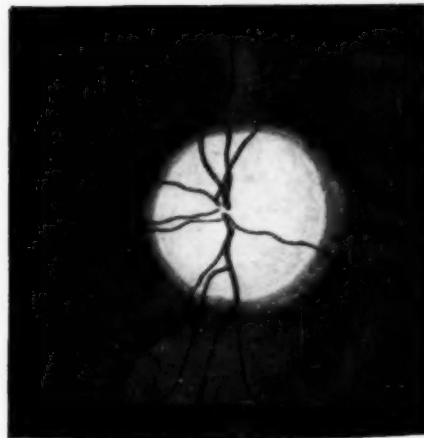
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CASE 7

CHANGES OF THE OPTIC DISC IN GLAUCOMA. A. FUCHS.



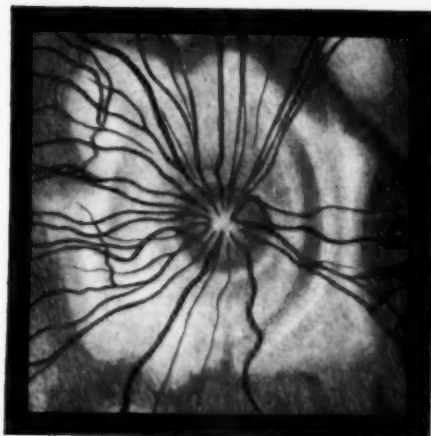
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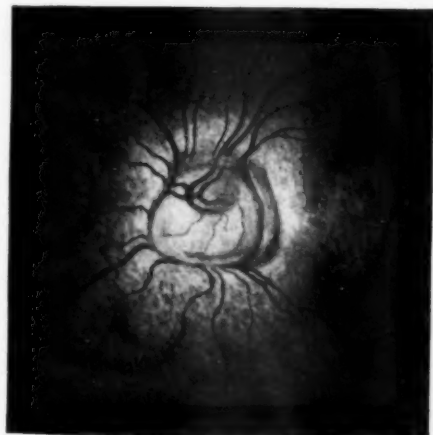
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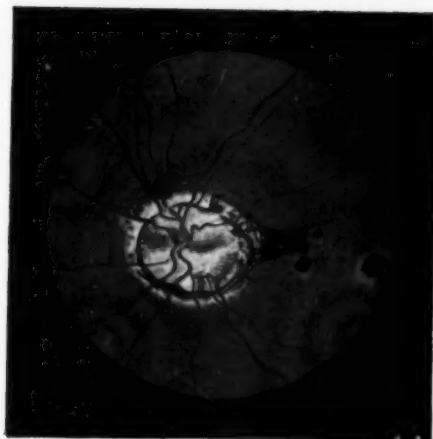
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CHANGES OF THE OPTIC DISC IN GLAUCOMA. A. FUCHS.

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CHANGES OF THE DISC IN CASES OF GLAUCOMA.

A. FUCHS, M.D.

VIENNA, AUSTRIA.

The various changes produced in the optic disc by increased intraocular tension are here considered, in relation to the anatomy of the parts, congenital anomalies, myopia, choroidal atrophy, etc. Fourteen cases illustrating the different appearances presented, and the anatomic conditions underlying them, are given. The descriptions are supplemented by colored plates and illustrations in the text. This paper is a summary of lectures delivered December 11-14, 1923, in the Peking Union Medical College, where Dr. Fuchs is this year Visiting Professor of Ophthalmology.

In former days acute glaucoma was believed to be an inflammation of the iris and was called "iritis urica." Later, even when the increase of tension was recognized as the cause of glaucoma, the ophthalmologist still had not a clear conception of the different clinical pictures of the disease. We read in one of Graefe's papers the difficulties in the differentiation and classification of this disease because the clinical manifestations are so varied. At that time the differentiation between primary and secondary glaucoma was not yet emphasized, and therefore primary glaucoma, acute and chronic inflammatory, was confounded with cases where the increase of tension was due to tumor, retinal detachment or iritis.

Even if we consider the clinical picture of primary glaucoma alone, we have enough clinical varieties. Between a glaucoma simplex, with deep anterior chamber, and a case of hydrophthalmos, and between an eye during an acute attack of glaucoma and the degenerated bulbus of an absolute glaucoma, there is an enormous variety of intermediary clinical manifestations.

The changes of the papilla in cases of primary glaucoma are rather numerous and the diagnosis at times may be difficult. I wish, therefore, to enumerate some of the different appearances of the disc in cases of glaucoma, using several cases for illustration. I wish also to compare them with papillae other than those of glaucoma, that simulate the discs of glaucoma.

1. The changes of the papilla are due mainly to the increase of *intraocular tension*. In regard to this both the degree and the duration of the tension are important factors. A very high intraocular pressure even lasting only a day or so, can produce very severe destruction in the optic nerve tissue, and we sometimes find the vision of an eye almost lost after such a severe acute attack. Therefore, such cases are sometimes not improved by any operation. We shall see later that such a sudden severe increase of tension can produce an atrophy of the papilla, without a characteristic excavation, due to destruction of the optic nerve tissue.

2. As a second factor causing changes of the optic nerve, the condition and the position of the *lamina cribrosa* are important. According to E. Fuchs, the lamina cribrosa is composed of a number of fenestrated lamellae superimposed upon one another. They are a continuation of the inner fibers of the sclera and bridge over the sclerotic-choroidal canal. The lamina cribrosa is slightly concave in front, and the center of the concavity lies about 0.50 mm., or 1.50 diopters, behind the level of the retina. The lamellae of connective tissue of the lamina cribrosa contain very numerous elastic fibers. The anatomic structure of the lamina cribrosa varies considerably in different cases; it is sometimes tight and apparently very resistant, and at other times it is delicate, being composed of only a few fibers.

Hence the lamina cribrosa, with the exception of the sulcus sclerae, is the weakest and most yielding part of the globe. Comparatively the sulcus sclerae seems to be more yielding in childhood and the lamina cribrosa in later life, because we see sometimes an intercalary staphyloma produced in the eye of a child which is not yet blind. In such cases the ectactic sulcus sclerae produced by the increased tension relieves the optic nerve and the lamina cribrosa of some of their pressure.

The rigidity and firmness of the lamina cribrosa explain why in some cases of simple glaucoma a simple optic atrophy appears at the beginning of the disease and is diagnosed as such, but a glaucomatous excavation develops later on. Hence the former diagnosis of simple atrophy was wrong, for it was a glaucoma in an eye with resistant lamina cribrosa. This lamina cribrosa gave way only after prolonged pressure. I had the opportunity of observing a case similar to those just mentioned.

History:—An elderly man was diagnosed to have optic atrophy nine months previously, and was given anti-luetic treatment. No symptoms of lues were found.

Examination: Externally both eyes are normal; both anterior chambers normal. Light reaction of right pupil absent and of the left normal. Both papillae show a typical picture of simple atrophy.

V. O. D. nil. O. S.=fingers at 1 meter. Left eye shows a tubular field with no color perception.

Tension: Both eyes are stone-hard. O. D.=80 mm. Hg., O. S.=65 mm. Hg. (Schiötz). It is remarkable that there were no external signs in either eye, indicating an increase of intraocular tension. It was due to the tonometric finding alone that the diagnosis of glaucoma was made.

We learn from this case how the lamina cribrosa can resist the pressure of a high intraocular tension for a long time. This may be an erroneous diagnosis, and it may be well to think of glaucoma in every case of simple optic atrophy.

3. As a third factor producing changes of the disc in cases of glaucoma, one has to take into consideration the rigidity and resistance of the corneosclera. If the sclera is thin and yielding, the entire eyeball will become enlarged when there is an increase of tension, and the optic nerve in the beginning will not show many changes. Later, when the ectasia bulbi has reached a certain degree, the optic nerve becomes more extensively involved. Therefore we find sometimes in hydrophthalmic eyes with consider-

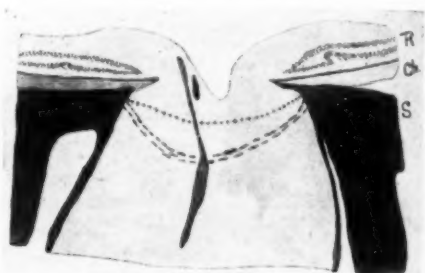


Fig. 1.—Diagram of section of optic nervehead after Fig. 2, Plate XII. A. Fuchs' Atlas of Histopathology. R. retina. Ch. choroid. S. sclera. Dotted and broken lines indicate different position of lamina cribrosa.

able enlargement more or less good vision.

On the other hand the condition of the sclera surrounding the optic nerve is important in regard to the ophthalmoscopic picture of the disc, for not only the lamina cribrosa but the surrounding sclera may also be pushed backward. We must consider that the primary change in the optic nerve, as a rule, is a yielding of the lamina cribrosa due to the increased intraocular pressure.* Sometimes this apparently occurs before the fibers of the optic nerve become affected. As an illustration I will refer you to a diagram of an optic nerve, (Fig. 1).

*This opinion, which is an ancient one, does not concur with the findings of E. Fuchs and Elliot, who believe that a yielding and atrophy of the lamina gliosa are the primary changes. I found in four eyeballs of primary glaucoma in the early stages, with considerable vision, a yielded lamina fibrosa and a large mass of neuroglial tissue in front of the lamina. There is no doubt that glaucoma can start with quite different pathologic changes, and also with edema and secondary atrophy of the nerve bundles behind the lamina cribrosa.

CASE 1—History: The cornea was destroyed by ether four months ago. A corneal staphyloma and secondary glaucoma followed. Light perception and projection good.

The diagram shows that the lamina cribrosa is lying considerably behind its normal position. The cross line represents the original position of the lamina cribrosa. The concavity of the lamina, normally being only a slight one, is considerably increased. The nerve elements of the optic nerve are apparently not affected. There is a rather marked vessel funnel, but no excavation. Upon the lamina a thick layer of nerve tissue is lying.

In this case the increased tension apparently lasted only for a short time, for the scar tissue of the staphyloma was yielding in the beginning, and the lamina cribrosa was relieved by the increased bulging of the scar.

We learn from such cases, of which the one illustrated above is an example, that:

a. The primary change is the yielding of the lamina cribrosa.

b. This change may not be observed when there is nerve tissue covering the lamina cribrosa and when the nerve tissue is not destroyed by the pressure of increased tension. Only in cases where the lamina cribrosa is visible on account of physiologic cupping can we judge the yielding of the lamina by an increase of refraction. The refraction of such an excavation then instead of being 1.50 D., as it is normally, is increased to 2.50 D. or 3.50 D.

The nerve tissue becomes atrophied on account of the pressure exerted on the nerve fiber layer. This atrophy appears sooner and more markedly on the temporal side of the papilla, because the nerve fiber layer here is thinner than that on the nasal side.

The condition of the margin of the sclerotic-choroidal canal may be of special importance in the destruction of the nerve tissue. Its edge is formed as a rule by the so-called connective tissue ring. The latter is interposed between the choroid and the nerve, producing the sharp circumference of the optic nerve, and is visible ophthalmos-

copically as a bright ring. Fig. 1, on the right side.

But often the inner margin of the sclerotic-choroidal canal is formed by the edge of the lamina vitrea which projects like a sharp knife against the nerve fibers. Fig. 1, on the left side. Possibly this anatomic condition is the reason why in some eyes the vision vanishes with rapidity during the course of glaucoma, while others may be able to withstand the increased pressure for many years without a change in their visual power. Especially in cases where a hydrophthalmos has come to a standstill, we can find a glaucomatous excavation and a slight increase of tension without a change of vision for years. As I will show later, the sharp projecting margin of lamina vitrea seems to have disappeared in these eyes, due to the universal ectasia.

I want to emphasize here, also, another mechanical condition which is perhaps of importance in causing an atrophy of the nerve fibers. The nerve fibers in the optic trunk are furnished with medullary sheaths and lose them as they perforate the lamina cribrosa. If now the lamina is pushed backward the nerve fibers will be retracted, because the lamina cannot glide over the nerve fibers behind it on account of their medullary sheaths. By this retraction the nerve fibers are further pressed against the sharp edge of the sclerotic-choroidal canal.

As a rule the atrophy of the nerve fibers follows immediately the yielding of the lamina cribrosa, therefore in the beginning of a glaucoma we sometimes see a vessel funnel change into an excavation which does not yet reach the margin of the papilla, and appears like a physiologic cupping. If we can observe the development of such a change we can make the diagnosis of glaucoma without difficulty. The findings on the optic nerve become characteristic only when the excavation has reached the margin. The extension of such an excavation which is commonly deeper than the physiologic one is recognized not only by its white color, but also by the bending and interruption of the fine vessels at the margin of the papilla. In the be-

ginning of glaucoma, such an excavation may involve only a sector of the optic nerve. Such a case I will now cite.

CASE 2.—History: A man 49 years of age has had attacks of pain and foggy vision in one eye.

Ophthalmoscopic examination: The color of the papilla is good; the lower temporal quadrant of the disc is occupied by a deep white excavation; the fine vessels crossing the margin of the excavation are curved there; the other vessels are normal. Plate X, Case 2.

Vision=6/8?, Jaeger No. 1. Tension + 2; 70 mm. Schiötz.

Visual field shows a sector shaped contraction for white and red on the nasal side.

A month later the temporal half of the disc was entirely excavated. Because pilocarpin did not reduce the tension to normal, iridectomy was performed.

In the beginning of glaucoma, only a part of this disc was destroyed, and one is induced to believe that one of the special anatomic conditions mentioned above had caused this local destruction. Perhaps the lamina vitrea was more projected against the nerve tissue at the outer lower quadrant.

We recognize the glaucoma in this case by the depth and marginal position of the excavation. Very similar pictures may be produced by congenital pits or saucer shaped defects. They lie as a rule below, or a little on the inner or the outer side, and belong to the group of colobomata of the optic nerve. In order to make the correct diagnosis we must then also look for some other congenital changes in the other eye, besides examining the visual field and tension. For comparison with case 2, I wish to describe a case with a congenital anomaly of the optic disc.

CASE 3.—A girl 22 years of age, has always had poor vision in her right eye.

Ophthalmoscopic examination: O. D. The temporal side of the reddish disc which appears as the papilla is deeply excavated, 4-5 diopters and is white. The excavation is divided into two parts by a whitish horizontal

ridge, which is slightly curved with its convexity below. The upper part of the excavation is partly covered, on the upper and nasal side, by a supertracted fold of nerve tissue. In the lower part of the excavation fine macular vessels are seen ascending over the steep margin. The central vessels appear at the nasal part of the excavation.

V. O. D.=6/60; with -5.50 sph -5.50 cylinder axis 50°=6/6. Jaeger I, visual field normal.

O. S. Conus superior and inferior. Vision = 6/18; with -2.00 sph -3.00 cylinder axis 20°=6/6. Jaeger I.

In this case there exists a colobomatous groove of the optic nerve and of the sclera beneath it. The slightly curved horizontal ridge in the center corresponds to the lower margin of the papilla and separates the hole in the optic nerve from the defect in the sclera. The reddish disc appearing at first as the head of the optic nerve, is not the papilla and is due probably to a defect of the pigment epithelium. The bending of the vessels at the margin of this pit leads one at first to suppose that it is a case of glaucoma.

The classical and pathognomonic change of the optic nerve in cases of glaucoma is a total glaucomatous excavation. The central vessels are displaced to the nasal side because the vessels following the atrophied nerve tissue gradually approach the nasal border. They are bent over the margin and appear interrupted because the vessels are partly hidden behind the overlapping border of the sclerotic-choroidal canal, where it is conically contracted.

I present here a picture of a total excavation in a case of absolute glaucoma, for the purpose of comparison with some other pictures which I will later describe. See plate X, Case 3.

CASE 4.—A man, 60 years of age, had had slight attacks of pain and blurred vision in the right eye which began four years ago. Two years ago the eye became blind.

Ophthalmoscopic Examination: The papilla is white, pot shaped and deeply excavated. The vessels are displaced

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toward the nasal side, interrupted, and bent over the sharp margin of the papilla. The dots of the lamina cribrosa are visible. The papilla is surrounded by a small bright area: halo glaucomatosum. Vision nil. Tension + 3.

The halo is caused by an atrophy of the pigment epithelium which disappears around the margin of the papilla. Hence the bright sclera and the choroid shine thru. Plate X, Case 4.

The dots of the lamina cribrosa are often visible, but sometimes we do not see them even in eyes with absolute glaucoma. They are then covered by the neuroglial tissue, which remained upon the lamina cribrosa. A picture of such a section is found in A. Fuchs' Atlas on page 32, figure 3. A compressed layer of neuroglia lies upon the lamina and, on the nasal side, a large mass of it contains a cavity. Sometimes the neuroglia remains in the form of a coulisse so that the central vessels, in spite of the apparent total excavation of the papilla, are not displaced to the nasal part of the disc but run forward to the level of the retina in their normal position.

By the appearance of the disc we can, as it is well known, draw no conclusion regarding the visual power. Sometimes we may believe that the optic nerve has been totally destroyed by the deep cupping and that the eye is blind, while considerable vision is still present. Such a case I wish to cite.

CASE 5.—History: A woman, 62 years of age, has never had eye trouble until four weeks ago, when she was disturbed by a shadow in the lower visual field of her right eye.

Ophthalmoscopic Examination: The papilla is white, totally excavated. The vessels are displaced toward the nasal border and interrupted. The dots in the lamina cribrosa are not visible. The lamina is homogeneously white, a little brighter in the center and slightly darker in the periphery. The papilla is surrounded by a narrow irregular halo. Plate X. Case 5.

V. O. D.—6/12, Jaeger 2 with correction.

Tension + 1.

Visual field: A typical sector shaped defect in the lower nasal quadrant connecting with the blind spot, fig 2.

By the ophthalmoscopic appearance of the disc one would have supposed that the eye was blind. The darker color of the periphery of the lamina cribrosa is caused by the shadow cast upon it by the overlapping part of the conically contracted sclerotic-choroidal canal. We do not see the dots in the lamina cribrosa because, in my opinion, they are covered by neuroglia. In cases which are preceded by at-

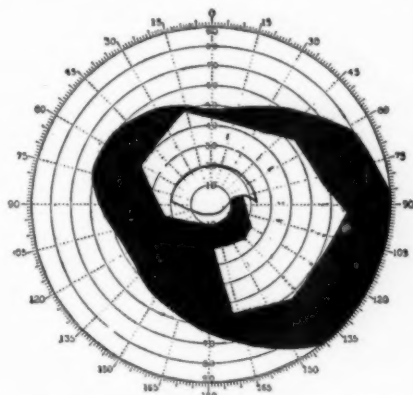


Fig. 2.—Field of vision, right eye, Case 2. Limitation of field to nasal side and below. Loss of form field shown in black. In remaining field, line shows boundary for red perception.

tacks of inflammatory glaucoma, there may be also some connective tissue elements covering the lamina.

Undoubtedly, there are some manifestations on the papilla, in cases of acute glaucoma, which we have to attribute to an inflammatory origin. If we have the opportunity to check a severe acute attack by medication or operation, we will not infrequently see a disc so intensely pinkish and indistinctly outlined, that we have to diagnose it as an edema or inflammation of the optic nerve head.

The following case is an example:

CASE 6.—History: A patient, 49 years old, has had attacks of blurred vision and pains in the left eye for two months. He comes to the hospital with a very severe attack of glaucoma. After the tension has been lowered by the use of miotics, an iridectomy is performed.

Examination: Twelve days after the operation, the papilla is reddish, a little gray on the nasal side, indistinctly outlined, and apparently somewhat swollen, especially on the nasal side. Vessels normal, no special excavation. Plate X, Case 6.

V. O. S.—6/8, Jaeger 2, tension, normal.

Visual field.—Sector shaped contraction, especially for red, in the lower nasal quadrant (Fig. 3).

Doubtless we have here a manifestation of a true slight inflammation

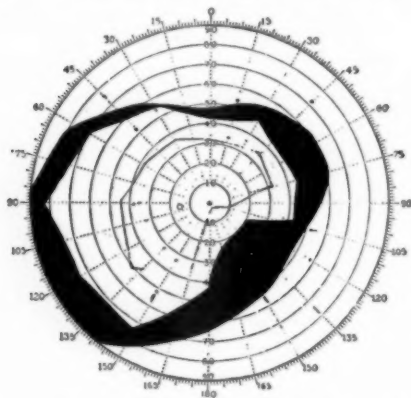


Fig. 3.—Field of vision in Case 6. Sector shaped contraction especially for red (inner line) in lower nasal quadrant.

of the papilla. As another proof of this fact I wish to say that we see, after such a slight neuritis, a development of secondary atrophy of the nerve. The papilla is then pale, indistinctly outlined, and the vessels are now thin, postneuritic atrophy. While we find on rare occasions, in cases of glaucoma without inflammatory attacks, a white papilla with sharp outline, simple atrophy, we not infrequently find, after a severe acute attack, a postneuritic atrophy, provided the attack is the first manifestation of the glaucoma and is checked by treatment.

The papilla may appear indistinct and swollen for another reason if an acute attack of glaucoma were checked by an operation. That is, when a considerable hypotony follows the operation. In every marked hypotony, as it is well known, the papilla may become swollen even without an opera-

tion, as in the case of iridocyclitis with hypotony. The reason is as follows: When the tension of an eye becomes very low the intraocular tension may become lower than the intracranial pressure; then the lymph stream which is normally flowing in the optic nerve from the papilla to the brain is reversed. The fluid flowing to the eye accumulates in the head of the optic nerve producing the ophthalmoscopic picture of papillitis.

But this hypotony after an operation for glaucoma can cause another interesting ophthalmoscopic picture namely, that a glaucomatous excavation, definitely recognized before the operation, can disappear after the operation. Similar to this type of cases I will present a case, where the excavation disappeared for another reason.

CASE 7.—History: A man, 70 years of age, came to our hospital with a severe attack of acute glaucoma. The papilla is slightly reddish and deeply excavated. The vessels are displaced to the nasal border and interrupted. Surrounding the papilla is a narrow halo and there is a temporal crescent. Plate X, Case 7.

Vision = fingers $1\frac{1}{2}$ meters. Tension + 3.

Iridectomy was performed. The tension afterwards was low.

Examination, three months after the iridectomy: The papilla is now white; the excavation insignificant. The central vessels have resumed their normal position and are not interrupted. The arteries have become very thin.

Vision = fingers at 5 meters (Jaeger 4). Tension, normal.

The lamina cribrosa in this case, as has been described by some authors, was restored to its normal position, mainly, probably, on account of its elasticity. The excavation got shallower in spite of the progressing atrophy of the nerve tissue, which is recognized by the increasing paleness of the disc.

Sometimes a restoration of the lamina cribrosa to its normal position may be stimulated by the disappearance of a deep glaucomatous excavation after an operation, due to the

filling in of the cavity with edematous neuroglial tissue on account of hypotony. The excavation sometimes becomes shallower and at other times disappears completely. We can recognize the cause of this fact for the central vessels are less distinctly visible at their entrance, being covered in parts by the edematous neuroglial tissue.

Papillae with anomalies often lead to a suspicion of glaucoma; viz., anomalous excavations of large size with considerable depth where the vessels appear interrupted at the disc margin. The suspicion of glaucoma may be corrected if we can see a narrow strip of reddish nerve tissue between the excavation and the margin of the papilla. Very rarely we miss such a strip and then we can exclude glaucoma only by other examinations and tests. A case with such a papilla simulating glaucoma I will now cite.

CASE 8.—History: A girl, 13 years of age has always had poor vision in both eyes. O. D. Fundus normal. Vision = 6/18, astigmatism with oblique axis. Tension 23 mm Hg. O. S. Papilla strikingly pale, with a slight reddish color at its margin. There is a large, but not very deep excavation which extends apparently to the temporal margin of the disc; the excavation is recognized by the bending of the macular vessels over this margin. The central vessels appear on the nasal side. Small temporal crescent. Plate XI, Case 8.

Vision = 6/18, astigmatism with oblique axis, Jaeger 1. Tension 16 mm. Hg. Visual fields normal.

The displacement of the vessels and the bending of their course at the margin lead us to suspect that there is a glaucomatous change. Indeed, the paleness of the disc is very striking. Possibly the child has had an undetected retrobulbar neuritis, following which the optic nerve became pale with no changes in the visual field.

The judgment of the condition of the papilla is difficult when the optic nerve enters thru the sclera obliquely, as nearly always happens in cases of high myopia and also in some other eyes. The central vessels then

wind around the supertracted nasal border of the papilla and may appear interrupted. Because the excavation in some cases of myopia appears rather deep, the judgment is rendered still more difficult as we cannot measure exactly with the ophthalmoscope the difference of the levels on account of the myopia. Such a case I will now present.

CASE 7.—History: A patient, 36 years of age, has always had poor vision. For seven years he has had trigeminal neuralgia, and his vision also has become poorer.

Examination: A beginning keratoconus is found. The papilla is pale and only partly visible because the nasal part is covered by the overdrawn retina, supertraction. The central vessels are shining thru this supertracted fold. The entrance of the vessels is not visible, it is hidden by the sclera. At the temporal side of the papilla is a broad white crescent. The papilla and the crescent are surrounded by a pigmented line. Plate XI, Case 9.

Vision — 4.00 sph \ominus —1.50 cylinder axis 30° = 6/12, Jaeger 1.

Visual field, normal. Tension, 18 mm. Hg.

From the pigmented line which surrounds the papilla and the crescent, we may get an impression at first as if there were a papilla with a deep excavation extending to the margin of the disc. In reality only one-half of the disc is visible on the nasal side of the white area, the other half being covered by the supertraction. The pigmented line corresponds to the margin of the pigmented epithelium. The crescent in this case is so white because the choroid is totally atrophied here and the sclera shows thru the nerve fibers. The decrease of vision was due to the beginning keratoconus.

Axenfeld recently emphasized the difficulty in recognizing glaucoma in cases of myopia with an oblique entrance of the optic nerve. He recommends, for all these cases of myopia where the vision decreases, close examination of the visual field, also on Bjerrum's screen, and of the tension for the purpose of excluding glaucoma.

Especially important is this examination when there are changes in the macula on account of myopia, because we know that we cannot judge exactly the amount of vision in such eyes by the changes in the fundus.

An appearance of displaced vessels or of bending vessels is sometimes caused by a congenital anomalous distribution, if, for instance, the vessels divide behind the lamina cribrosa. Some of the branches may appear at the margin of the papilla dipping from here into the retina. See schematic sketch, fig. 4 of a normal division and sketch fig. 5 of division behind the lamina. We may then see no vessels

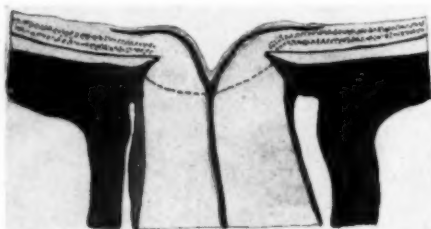


Fig. 4.—Vertical section of optic nerve head, showing usual branching of vessels in front of lamina.

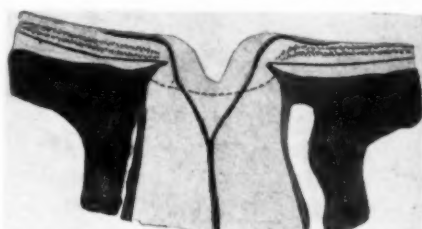


Fig. 5.—Section of nerve head, showing anomalous branching of retinal vessels behind lamina.

in the center of the papilla. Such cases are similar to glaucoma because in a deep glaucomatous excavation we do not see the central vessels where they perforate the lamina, if we focus with the direct method upon the margin of the excavation and the retina. I wish to refer to a case where such a congenital anomaly of the division of vessels was associated with glaucoma.

CASE 10.—A woman, 46 years of age, a week ago had her first typical attack of glaucoma, which was checked by pilocarpin.

Examination: O. D. The papilla is somewhat paler than that of O. S. The veins appear from the margin of the papilla but the central vein and its division are not visible. The central artery and its division are in the normal place but the arteries are thin. Plate XI, Case 10.

Vision = 6/8, Jaeger 1. Visual field, contracted above for white and red. The blind spot is a little enlarged. Tension normal, after pilocarpin.

In this case, the atypical division of the vein simulates a distortion and in-

terruption of the vessels in a case of glaucoma.

CONDITIONS OF SCLERA.

Very interesting are the changes in cases of glaucoma which are due to special conditions of the sclera.

First, I wish to describe the special alteration of the sclerotic-choroidal canal which is found in some cases of hydrophthalmos. By the total ectasia of the bulbus, not only the base of the cornea and the cornea itself become enlarged, but also the inner opening of the sclerotic-choroidal canal widens, so that it becomes larger than the optic nerve trunk. As an instance, sketch

fig. 6* shows a totally excavated nerve head in a case of hydrophthalmos. The sclerotic-choroidal canal is enlarged in front like a funnel because the opening in the lamina vitrea choroidea (D. D.) is much larger than normal. Comparing it with fig. 1, where the normal conical contraction is to be seen, makes the difference obvious. The total atrophy of the optic nerve, in cases of glaucomatous cupping, usually does not change this part of the sclerotic-choroidal canal. But in hydrophthalmic eyes, the anterior margin of the sclerotic-choroidal canal (M) is smooth; and the sharp edge, often present at this place, disappears. For this reason also, it may be that sometimes in an hydrophthalmic eye, relatively good vision is preserved in spite of the increased tension.

Secondly, in cases of myopia, an ectasia of the sclera may occur at the posterior pole of the eye and around the papilla which produces a special ophthalmoscopic picture. The most

*This sketch is made according to figure 5 of plate XIII of A. Fuchs' Atlas of Histopathology.

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common variety of these ectasiae is the staphyloma sclerae posticum verum, which Scarpa found first anatomically and described without knowing its importance in myopia. This ectasia of the posterior pole has nothing to do with increased tension, but is caused by a weakness of the sclera at the posterior pole in cases of high myopia. Ophthalmoscopically the ectasia appears as a dark curved stripe about one-half disc diameter from the nasal border of the papilla. It is a reflex caused by a step in the sclera. Here the curvature of the sclera changes suddenly and the ectasia begins. The stripe is visible only at the

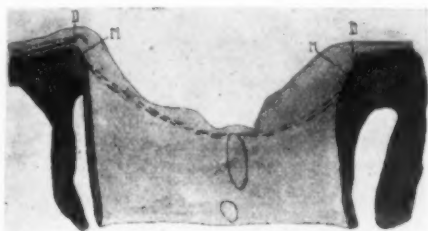


Fig. 6.—Total excavation of optic nervehead in a case of hydrophthalmos. D.D. enlarged opening in lamina vitrea of choroid. M.M. margins scleral canal rounded by distension.

nasal side because here the ectasia begins abruptly, while on the temporal side the protruded sclera merges gradually into the nonectactic sclera. A picture of this condition is found in Haab's Atlas. (Eng. Edition 1901, Fig. 79)

As regards the nomenclature of this condition, I wish to emphasize that the staphyloma posticum verum is to be strictly differentiated from the circumpapillary atrophy of the choroid, which is so common in cases of myopia, and which is still often erroneously called staphyloma posticum. The latter term is wrong and therefore its usage for the latter condition should be discontinued, because in a case of circumpapillary atrophy of the choroid there is, as a rule, no ectasia.

As is well known, in cases of high myopia the sclera is everywhere thin, especially at the posterior pole. I do not wish to say much concerning the causes of this attenuation of the sclera, but sometimes it is so marked that there are considerable defects found in the sclera of highly myopic eyes. If glaucoma occurs in a highly myopic

eye, we may find a bulging out of the sclera in the neighborhood of the papilla, besides its glaucomatous changes. This bulging appears ophthalmoscopically most often as a grayish stripe, and on the temporal side of the papilla. It corresponds to a "step" in the sclera over which the retinal vessels bend. This line is easily differentiated from staphyloma posticum verum, by its temporal position and its being more grayish and less brownish in color. Such cases have already been described by von Graefe and later by other writers.

A description of an anatomic specimen of such a case was published by E. Fuchs in the *Klinische Monatsblätter f. A.* 1919. I will use a case in order to describe this condition more in detail.

CASE 11.—History: A woman, 66 years of age, had typical attacks of glaucoma in the right eye for one year.

Examination: The papilla appears slightly reddish in contrast to the white area surrounding the disc. The papilla is not excavated, the vessels are very thin and they are not interrupted. The entrance of the central vessels is not displaced. About $\frac{1}{2}$ to $\frac{3}{4}$ disc diameter from the disc margin a slightly curved and grayish stripe is seen on the temporal side as well as on the nasal side of the disc, with their concavities facing toward the margin of the papilla. They lie within the white circumpapillary area of atrophy of the choroid. Their dark color is apparently due to a reflex. Over these two stripes the retinal vessels bend and show a parallactic movement. On account of the high myopia it is not possible to measure the difference of refraction.

The papilla and the two stripes are lying within a large white irregular area: circumpapillary atrophy of the choroid. The fundus is bright and is covered by numerous round white spots of different sizes where the choroid and the pigmented epithelium have atrophied. In the macular region there are several small hemorrhages and a pigmented focus. Plate XI, Case 11.

V. O. D. = Light perception 15 cm. Tension 60 mm. Hg. (Schiotz).

In the left eye there are similar myopic changes in the fundus.

V. O. S. with — 7.00 sph = 6/24, Jaeger 3.

I do not wish to discuss either the dollar shaped areas of atrophy of the choroid, or the cause of blindness in this case. I only wish to mention the ectasia around the papilla. We recognize it by the two reflex stripes which are slightly curved and characteristically situated on both sides of the papilla. If there were only one stripe present on the nasal side we would suspect a staphyloma posticum verum in myopia. Much more important is the stripe on the temporal side, between the macula and the papilla. We see such temporal stripes sometimes in cases of myopia without a corresponding stripe on the nasal side and without the presence of glaucoma. Such a temporal stripe is suspicious of glaucoma, only when the vessels are bending over it, indicating that there is an ectasia with a step in the sclera. I emphasize again that while a nasal step with bent vessels is not characteristic of glaucoma, a temporal step always indicates a strong suspicion of glaucoma, and we should employ every available means to assist us in our diagnosis.

A similar nasal stripe sometimes resembles a Weiss-Otto reflex. The differentiation is not difficult for, first, the Weiss-Otto reflex is a yellowish white stripe and not grayish, secondly, it changes its position with the movements of our ophthalmoscope, and thirdly, it is usually more curved and lies nearer to the papilla, and often crosses its nasal margin. The grayish stripe may correspond sometimes to the line where the dural sheath of the optic nerve arises from the sclera.

Thirdly, I wish to refer to a very rare case of ectasia of the sclera at the side of the papilla where no myopia was present.

CASE 12.—History: A woman, 48 years of age, has had diminishing vision for 10 years. At present she sees only the lower half of objects.

Examination: The region of the papilla is occupied by a white area two and one-half disc diameters in size which is deeply excavated and sharply outlined. In its upper part the real papilla is recognized by the entrance of the central vessels. Only the lower

half of the papilla is visible. It is sharply defined from the other white floor of the depression by a gray line with its convexity below. The vessels are distinctly visible at the overhanging edge of the depression. Upon the papilla they are less well defined and upon the floor of the depression, beneath the papilla, they are very blurred or almost invisible. The periphery of the depression is somewhat darker than the center. The floor of the depression is found to be 6 to 7 diopters below the level of the retina but the papilla is a little higher than the de-

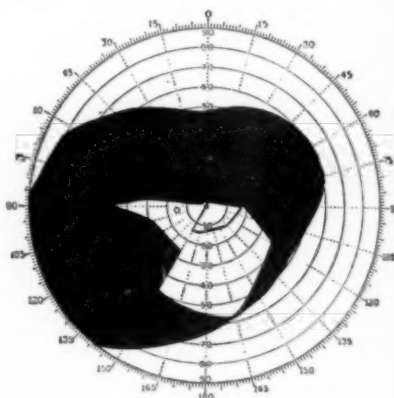


Fig. 7.—Visual field of left eye in Case 12. Only lower half retained.

pression. The vessels bend over the edge of the depression and are interrupted. At the upper part of the depression some remnants of the nerve tissue are recognized. The depression itself is surrounded by a large yellowish area of the fundus where the pigmented epithelium is atrophied. The fundus has a refraction of 1 diopter. Plate XI, Case 12.

V. O. S.—6/60, Jaeger II with correction. Visual field: Only the inferior field is left, Fig. 7. Tension = 25—30 mm. Hg. (Schiötz).

CASE 12.—In this case not only the lamina cribrosa, but also to a greater degree, the sclera at the lower margin of the papilla, is pushed backward. We must imagine that the lamina and the optic foramen of the sclera are lying obliquely, because the floor of the scleral ectasia is lying deeper than the lamina cribrosa. We recognize it by the ophthalmoscopic examination and there is a suggestion of it in the drawing. The picture was made while the

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edge of the ectasia was focussed, therefore the vessels at this place were sharply drawn while the vessels upon the lamina are less distinct. The lamina lies in the upper part of the white area and only its lower half is visible, the vessels on the floor are almost invisible because they were not focussed by the artist. The upper half of the disc is covered by the overhanging margin of the ectasia. At the upper margin of the depression the nerve tissue is recognizable, because the blood vessels coming from the retina disappear in it a little distance

horizontal or the vertical meridian of the papilla. Because such specimens are rare, and because they illustrate well the conditions mentioned above, I herewith reproduce the sketch, fig. 8, for illustration.

CASE 13.—History: A woman, 34 years of age, was always blind in the left eye, where she had also a squint. For three weeks the patient had pains in this eye, and two weeks before admission into the hospital, a hemorrhage was found in the eye.

Clinical examination: O. S.—The cornea stippled. Anterior chamber is shallow. The pupil is wide, with ectropion uvae. No light reaction. Vitreous body is filled with blood. Tension + 3. Vision nil. Diagnosis: Glaucoma hemorrhagicum.

Anatomic examination: Fig. 8. The optic nerve is thinner than normal on account of total atrophy. The lamina cribrosa is excavated and is not very distinctly recognizable behind the cross section of the central vein, because the retina, being totally detached, is pressed into the excavation. The folded retina is compressed and extends forward like a cord. Apparently there was an increase of pressure in the subretinal space which totally detached the retina and pressed it into the excavation. The cul-de-sac of the intervaginal space between D and P is enlarged on both sides, the left considerably more than the right.

The inner scleral lamellae, near S, form the roof of the intervaginal space on both sides. Part of these lamellae then pass over the nerve to form the pia, P, and the other part bridges across the sclerotic-choroidal canal as the lamina cribrosa. The lamellae radiating into the optic nerve are mainly visible on the left side. The outer layers of the sclera, which are lighter in shade in the sketch, turn backward into the dural sheath D.

The sclera is markedly bent on both sides, B and b, in the neighborhood of the optic nerve. At B both layers of the sclera change their course and extend backward but the deepest depression is near S, where the attenuated roof of the intervaginal space is mostly pushed backward. This place would have appeared as an enlarged floor of the excavation, had an ophthal-



Fig. 8.—Diagram of condition in Case 13. R, retina, detached and pushed into cut. B.b. marked bends in sclera. S.S. roof of intravaginal space. D.D. dural sheath. P.P. pia sheath of optic nerve.

above the edge overlapping the papilla. This explains the astonishing fact of the retention of her lower visual field. Plate XI, Case 12.

This case may be explained by a congenital weakness or a poor development of the sclera beneath the disc which later, together with the disc, was pushed backward by an insidious glaucoma. We must imagine that this part of the sclera was less resistant than the lamina cribrosa because the latter is pushed backward less than the former. The congenital etiology of this change is suggested by the fact that the position of the ectasia is below the papilla, where the failure of the closure of the optic cleft usually occurs.

I found in an anatomic specimen a similar ectasia of the sclera around the papilla. The bulbus was cross sectioned thru the equator by others and each half was embedded separately. Hence it was impossible for me to tell whether the section, herewith illustrated, fig. 8, was made thru the

moscopic examination been possible. On the right near b, the bending takes place at the point where the fibrous capsule of the eye is weakened by the formation of the dura. Hence only the roof of the intervaginal space is pushed backward.

I believe the anatomic picture of Case 12 is similar to this sketch of Case 13. But the latter probably is not caused by a congenital weakness of the sclera, because neither the choroid nor the sclera shows any defect. If there were no detachment of the retina in Case 13, and if the fundus had been ophthalmoscopically visible, the papilla would have been seen in an oblique position and the point corresponding to S would have been the deepest portion of the depression. This is quite similar to Case 12 where the deepest point of the excavation was below the papilla.

In conclusion, I wish to describe one more case, in which after an injury a condition similar to that of Case 12 was produced. This case was observed by K. Lindner.

CASE 14.—History: A girl, 24 years of age. Her left eye was hit by a snowball in childhood. Since then the vision of this eye has been impaired.

Examination: The papilla is not visible. In its place there is an oval depression, the base of which is formed by both white and gray tissues. In the center, and also below and on the temporal side, the central vessels originate. At the upper margin the vessels are all interrupted, below they are merely bent over it. The upper part of the depression has a depth of about 3-4 diopters, and the lower part about 2 diopters. The entire depression is everywhere surrounded by pigment. The upper margin appears sharp and is white. In the macula and between it and the disc, there are several pigmented foci of choroiditis. Plate XI, Case 14.

V. O. S. = fingers from 1-2 meter, indirect vision. The visual field is small and eccentric for a test object of 3 cm. Tension, normal.

We have here evidently a case of evulsion of the optic nerve. In spite of the papilla being covered by tissues, it lies behind the level of the retina and is oblique. According to the cases of evulsion of the optic nerve published

by various writers, we must consider this tissue as being mostly connective tissue. Bachsetz explains the evulsion of the optic nerve as follows: By a sudden compression of the eye due to a severe blunt injury the lamina cribrosa can be torn away from its place of insertion, and both the head of the optic nerve and the lamina cribrosa can be pushed backward into the tube formed by the dural sheath by an increased intraocular tension like a projectile in the barrel of a gun. This type of injury is parallel to the indirect scleral rupture at its typical place, namely, above the limbus in the upper inner quadrant.

If we wish to explain the pathogenesis of the present case, 14, we must suppose that there was a rupture of the lamina cribrosa from its upper insertion. The optic nerve was not totally evulsed but was considerably pressed backward above. Hence the following facts are explained; viz., the depression, the oblique position of the papilla, the tissue covering the papilla, the fact that the vessels were not totally lacerated, and the reason why the vision was not totally destroyed. The similarity to congenital anomalies and glaucomatous changes is obvious.

I have tried to describe the many and very different appearances of the disc in cases of glaucoma, with the purpose of emphasizing again the insufficiency of ophthalmoscopic examination for many of these cases. Only a thoro examination for glaucoma, especially the examination of the blind spot by Bjerrum's method, can save us from errors in diagnosis. I have also attempted to show the reason why in some cases of glaucoma, the vision may not be totally abolished in spite of an increase of tension. I wish to emphasize especially that an increased tension to 30 or 35 mm. Hg., after an operation for glaucoma, is sometimes borne for years without damage. In such a case, it is not the tonometric findings but the other examinations, particularly that of the visual fields, that guides us in our determination of the necessity of a second operation.

In conclusion I wish to express my hearty thanks and appreciation to Dr. Nitsch for his kind help in painting the colored plates used in this paper.

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CONGENITAL CORNEA PLANA.

WILBER E. SWETT, M.D.

SAN FRANCISCO, CALIFORNIA.

This anomaly is rare and very few cases have been reported. This case unavoidably lacks any family history, but presents the typical clinical picture. It is most likely to be confused with microcornea but the differential diagnosis, as here described, is definite and not difficult, if the existence of this condition be borne in mind. This case was studied in the Clinic of Ophthalmology, Stanford University Medical School, San Francisco, California.

The recognized clinical picture of cornea plana, altho a rare condition, is a distinct clinical entity, which has been well described by Friede, but a review of the literature shows it to have been confused in some instances with microcornea.

The following case, a small orphan boy, seven years of age, was examined in the Out-patient Clinic during October, 1923, for the complaint of poor vision, and on examination both corneas were found to be flat, oval and so unusual in appearance, that further investigation was indicated.

The boy was living at the time in a foster home and knew nothing of his real parents. All efforts thru his orphanage, foster parents and Childrens Welfare Association failed to give any information regarding the past history of his parents, so the family history is wanting. A complete physical examination revealed no other malformation than the cornea plana and a 5° internal strabismus of the left eye.

The following description applies to both eyes. The most noticeable gross abnormality is the flatness of the whole frontal section of the globe with its small vertically oval cornea, which appears flattened as tho the iris were directly against the posterior surface. There is no distinct limbus, the white of the sclera gradually fading into bluish-gray, thence into the transparent cornea with no sharp line of demarcation, and the curvature of the cornea being continuous with that of the flattened anterior section of the globe.

The globes were measured with calipers and found to be of normal size. The corneas were vertically oval and in reality larger than they appeared, the apparent smallness of the trans-

parent portions being caused by the irregular over-reaching of the limbus. The transparent portion of the corneae measured 9.5 mm. in the horizontal and 10.5 mm. in the vertical.

This delicate over-reaching limbus involved the conjunctiva, episclera and superficial layers of the sclera; and projected into the corneal tissue forming an indefinite, irregular margin, varying from .5 mm. to 1.0 mm. in width. However, this zone cast no shadow on the iris.

The fine marginal capillary loops penetrated these parenchymatous stripes and melted toward the transparent portion, but at the limbus, there was a definite increased vascular development. The corneal microscope revealed many small linear grayish dots, in the transparent portion, similar to those seen in the nebulous marginal zone, and probably of the same tissue.

The fact that the cornea is larger than it clinically appears can be demonstrated by transillumination or oblique illumination. The normal cornea has a horizontal diameter of 12 mm., and a vertical of 11 mm. Measurement of the cornea in this case by using the iris angle by the above method gave the horizontal diameter 10.5 mm. and the vertical 11.5 mm. which approximate the normal dimensions.

As a result of the marked flattening of the cornea, the reflex image of the window covers most of the corneal surface and extends unbroken across the limbus on to the neighboring sclera. This phenomenon is well shown by the form of the high-light in the photograph, which will be seen to extend from the scleral surface to the center of the cornea, without any break or deformity of the image at the lim-

bus. It will be noticed that it is broader than normal, especially the corneal end, which is broad and indefinite, rather than sharp and pointed, as would be expected on a flat surface.

The anterior chamber was so shallow that the iris appeared to be in contact with the posterior surface of the cornea, and the iris angle was wider than normal due to the overlapping marginal zone. The iris and

The total refractive error found by retinoscopy was $+9.50$ at 90° and $+10.0$ at 180° .

Vision: Right: 20/200, $+6.50$ Sph. = 20/40; left: 10/200, $+7.0$ Sph. = 20/70.

Tension: Right 40 mm., left 36 mm. (McLean Tonometer).

The tension taken with the fingers was full and equal; the information derived in this way seemed to be more



Fig. 1.—Cornea plana. (Case of Dr. Swett.) Note small size of transparent portion of cornea; and the shape, position and size of the high-lights on the cornea.

lens were normal in appearance and position, so that the extreme shallowness of the anterior chamber was due to the flatness of the cornea, and not to an abnormal curvature forward of these parts.

Careful examination of the fundus, lens and vitreous under a mydriatic proved these to be normal in every respect.

Measurement of the corneal refraction by means of the Javal was difficult, due to the flatness of the corneas, so that the step images were very distorted and approximated with difficulty. The approximate readings were:

Right: horizontal 34 D., vertical 33 D., Left: horizontal 34 D., vertical 34-35 D.

Corneal Radius: Right 11 mm., Left 11 mm.

reliable than the tonometer readings owing to the nonconformity of the footplate to the flat corneal surface.

The visual fields were normal for white, but the test for color fields could not be taken with precision, because of the boy's age. However, the color sense was normal.

Wassermann: Negative.

Rübel described this congenital anomaly in three brothers as follows: There is a noticeable flattening of the anterior bulbus section and of the cornea. The curvature of the cornea goes over into the bordering sclera without forming an angle. The delicate parenchymatous cloudiness which extends into the transparent cornea has an undefined, irregular line of demarcation, and gives the cornea the approximate shape of a flat oval. The limbus is more or less strongly vascu-

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lar, however, the development of the vessels reaches only a short distance, or not at all into the corneal tissue. The anterior chamber is shallow, the angle is arched over by the sclera. The iris is poorly developed but reacts normally. The lens, vitreous and fundus normal in all cases.

The three cases were summarized as follows:

Diameter of cornea: 8 to 9.5 mm.

Corneal refraction: 23 D. to 32 D.

Corneal radius: 10 to 12 mm.

Total refraction: 3 D. to 7 D. Hypermetropia.

The constant recurring findings are the smallness and flatness of the cor-

nea and the reaching over of the limbus onto the cornea. This peripheral cloudy, or parenchymatous zone, is milky white in color and gives the impression that the sclera is continued on to the cornea.

Von Hippel and Rübel found this delicate parenchymatous cloudiness to be similar to the sclera in structure, and could find no cause for the condition other than a congenital anomaly.

Corneal plana seems to be a stationary condition since a later increase or decrease in the curvature has never been noticed.

The following table is useful in differentiating cornea plana and microcornea:

CORNEA PLANA.

1. Abnormal flatness.
2. Poorly defined limbus.
3. Corneal refraction, average 28-35D.
4. Corneal radius: 10 mm.
5. Total refraction: +7.0 D.
6. Normal formed or enlarged bulbus.
7. Malformation of the anterior segment and limbus.

MICROCORNEA.

1. Increased or normal corneal curvature.
2. Normal, clearly placed limbus.
3. Average 46D.
4. 7.3 mm.
5. -2 D. up to +18 D.
6. Microphthalmic.
7. Malformation of the entire globe, limbus normal in shape.

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REPORT OF A CASE OF DOUBLE CHOKED DISC WITH RECOVERY FOLLOWING TRAUMA.

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A girl of seven years, with cerebral symptoms which had continued three years, had been under observation for several months, when she began to have blurring, then swelling and choking of the optic nerveheads. The swelling of the papilledema measured 3 or 4 D., with hemorrhages. A fall on the floor, striking her head, was followed in three days by disappearance of cerebral symptoms and gradual return of the optic discs to normal.

J. J., a girl aged 7 years, was brought to us by her mother in Nov., 1921, with the following complaints—paroxysmal headaches, vomiting attacks, unsteadiness in walking with frequent falls.

History—Normal birth, no illnesses prior to present illness except mild attack of pertussis when 3 years of age. Always healthy and well. No operations. No trauma except fall on pavement when 4 years of age—not followed by any unconscious period nor by any bleeding or visible injury. Mother and father both living and well. No brothers or sisters.

Present Illness. About the fall of 1918, when the child was 4 years old, she had a sudden spell of vomiting one morning before breakfast. Soon after this, she began to have vomiting spells at about two week intervals, associated with dull headache in the occipital region. After vomiting the child would feel all right and play normally the rest of the day. All these vomiting spells occurred shortly after waking up in the morning and before the patient got dressed. She was taken to her general physician and to a children's specialist. Put on strict diet without relief. Case was described as "Nervous indigestion". In summer of 1919 received several osteopathic treatments, with temporary relief from vomiting attacks for several weeks. In the fall of 1919, however, the attacks returned and increased slowly in severity and in frequency. Consulted other general physicians who took Wassermann, which was negative, and who gave electrical treatments which aggravated the condition and made the child very nervous, so that she twitched for some hours after the treatment. About this time the mother noticed a slight unsteadiness in walking.

There was no improvement in the child's condition under any treatment,

tho the family spared no time or expense in trying to help find the trouble. Other doctors were seen and one suggested a "mild poliomyelitis". The condition grew steadily worse, with as many as six or seven vomiting spells before breakfast in the morning associated with distressing retching and oftentimes no vomitus. (Distinctly a reflex vomiting.) The staggering gait had grown worse, so that the mother always took the child's hand to steady her when walking on the street. The child fell frequently in the house and outdoors, and her knees and elbows were a mass of bruises and abrasions. It was at this time, Nov., 1921, that the child was brought to our office and was seen by the late Dr. W. R. Broughton, the first time an oculist had been consulted. His findings were as follows:

Vision R. 20/20, L. 20/20, each tolerates +0.75. Pupil reactions normal. Phorometer, esophoria 1 degree. No hyperphoria.

Nov. 25, 1921. Test under homatropin.

Vision R. 20/50=20/20 with +0.75 sph. L. 20/40=20/20 with +0.75 sph. These glasses were ordered.

Ophthalmoscope. Reveals normal nerveheads. Retinal vessels tortuous in each eye.

Thruout the winter of 1921-22 the child did not improve, but slowly grew worse. She was attending private school but could only go about half the time, many days being confined to bed all day with the same vomiting and constant headache. In the early part of 1922 the child was taken to Dr. C. H. Smith, who believed the case to be one of cyclic vomiting.

One morning in May, 1922, the child had a nervous spell with shrieking, rigidity of all the extremities and slight twitching. The child lay on her face in bed and the mother could not notice the

child's face during the attack, which lasted only a few minutes. No coma or sleepiness followed. During the spring of 1922, the mother noticed short periods when the child became confused in speech—"words just wouldn't come."

Consulted us again May 8, 1922, with findings as follows:

Vision 20/20 in each eye.

Fundus. Optic nerves definitely blurred on nasal and upper edges. Retinal vessels all very tortuous and full.

Diagnosis. Increased intracranial pressure—probably brain tumor. Patient referred to Dr. Fred S. Tilney, neurologist.

Dr. Tilney saw the child two days later and his neurologic findings were as follows:

Voluntary Motor System. Gait. Staggering to right especially in walking fast or running. With eyes closed, some unsteadiness in a circle but nothing very definite.

Coordination. Some swaying, standing with heels together and eyes closed.

Reflexes. Deep active and equal except patella and possible ankle clonus. Superficial absent.

General sensation normal. Olfactory nerves normal. Optic nerves normal except for disc elevated in left eye and possibly in right. Hearing in right ear may not be quite so good as left. Blood pressure 100/80.

Diagnosis (tentative). Migrainous attacks. Possible right cerebellar tumor.

On May 17th, 1922, Dr. C. H. Smith, in consultation with Dr. Tilney and ourselves, had an X-ray of head taken by Dr. A. H. Busby, report of which is as follows: "X-ray examination of J. J.'s head shows a cranium which appears over large with cranial bones abnormally thin and convolutional impressions deepened, particularly in the posterior portion—indicative of intracranial pressure. There is, however, no change in bone detail indicating rarefaction. The sellae turcica appears abnormally small.

"The dorsum sellae is broad and long, the posterior horn reaching forward and in close proximity with anterior horn. The floor of the sella is moderately shallow and the size of the sella appears restricted above by the large dorsum sellae. The changes noted of internal table of cranial bones appear too general to be

caused by local cranial tumefaction. The case is more suggestive of pituitary interference and general intracranial pressure."

In June the child had an exploratory laparotomy (without our knowledge or advice) with removal of the appendix, no other findings except the enlarged colon. While in hospital had no vomiting attacks for ten days. Then the child had another nervous spell (convulsion?) with rigidity of extremities, but no definite clonic contractions. Following this there was a return to her former spells of vomiting and headache.

In July the child complained of seeing double and was brought again to our office. Tests at that visit: Vision 20/20 in each eye; Fundus revealed a marked papilledema in each eye, measured 3 to 4 diopters of swelling (1 mm+). Marked tortuosity of vessels. No hemorrhages. Homonymous diplopia increasing to the left. Esotropia straight ahead, of 7 degrees. Paresis left external rectus.

We felt sure that the patient had an intracranial growth and requested another consultation with Dr. Fred S. Tilney. The child was seen by Drs. F. S. Tilney and Chas. A. Elsberg on July 31st, and they corroborated our diagnosis and advised an operation as soon as convenient to the family. The family postponed it, as they believed the child should have a longer period to recover from the abdominal operation done in June.

The patient was seen again by me on August 3rd and again August 17th, at which time I noted vision still 20/20 each eye. Homonymous diplopia, not increased on either side. Esotropia 15 degrees straight ahead. Fundus shows small flame hemorrhages in the summit of the edematous discs and to the temporal side of the right disc. Both discs swollen $3\frac{1}{2}$ to 4 diopters.

I believed that with the onset of the hemorrhages she should be operated on immediately and referred her again to Dr. Tilney with that in view. An appointment was made for this four days later, as Dr. Tilney was away on vacation.

The evening following the last visit to my office and before seeing Dr. Tilney, the mother and child were sitting on the

porch of their home and the child fell asleep on a porch settee. In a short while the child fell to the porch striking her head, the height of the fall being about two feet.

The child awoke screaming and was carried upstairs and put to bed. She complained of headache and cried for a short while. No vomiting or other symptoms. Finally she went to sleep and slept all night. For two days "she was listless, had dull headache and had a high fever," tho the temperature was not taken with a thermometer. Appetite was gone.

On the morning of the third day following the fall, the patient got up and the mother said she seemed perfectly normal, acting like a different child.

From that day, Aug. 17, 1922, to this, the child has not had a vomiting spell. Headaches have gone completely. The ataxia and staggering stopped immediately and she has not fallen since, tho she skated both with ice and roller skates last winter and summer. The diplopia disappeared.

The child has been coming to see me off and on since the fall, and I will summarize the ocular findings.

Aug. 29, '22—Single vision straight ahead. Diplopia with red glass, however, increasing to the left. No new hemorrhages.

Sept. 5, '22—Single vision on all sides. Discs measure 3 diopters. Trifle more on left than right. Vision 20/20 each eye.

Sept. 25, '22—No hemorrhages visible. Discs less swollen, about 2 diopters.

Oct. 9, '22—Right disc measures +1.00. Left disc measures +1.50.

Nov. 10, '22—Discs clear in most of outline.

Jan. 20, '23—Discs measure at most +0.50. Left greater than right.

May 8, '23—Has been perfectly well. No headache or vomiting. Was slightly nauseated two or three times. Discs perfectly clear in outline thruout. Seen best with hole or -0.50.

No hyperphoria. Esophoria 2 degrees. No diplopia. Vision 20/15 in each eye. Fundus, shows slight tortuosity of retinal vessels persisting.

Oct. 25, '23—Child has remained perfectly well. It is now 1 year and 2 months after the fall. Fundi normal. Discs clear. Vision 20/15 in each eye. Phorometer—no hyperphoria. Esophoria -1 degree.

Conclusions: The child had all the evidences of intracranial pressure to the point of justifying operation. What was it due to?

I believe we can eliminate all inflammatory conditions such as tubercle, secondary internal hydrocephalus, syphilis, meningitis or encephalitis. I believe we can eliminate any solid tumor, such as glioma, endothelioma or fibroma. It is my opinion, and of course it is only a conjecture, that the child had some form of benign cyst, either epidural or subdural, which had grown so thin walled in its development that it was ruptured at the time of the trauma.

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CYCLOPLEGICS IN REFRACTION, PERMANENT LOSS OF ACCOMMODATION FOLLOWING THE USE OF HOMATROPIN.

JAY C. DECKER, M.D.

SIOUX CITY, IOWA.

The writer's views with reference to the use of cycloplegics are given and his method of using homatropin is described. A case is reported of a man of thirty-six, with less than standard vision in each eye, in whom vision was improved by correcting lenses determined under homatropin. Eserin was then used but after five days he could not read large print with distance glasses. He did not recover accommodation subsequently, altho eserin helped it temporarily. Read before the Sioux Valley Eye and Ear Academy meeting, July, 1923.

One of the important duties of the Ophthalmologist is that of refraction, or the measurement of ametropia. Each ophthalmologist, in time, naturally selects the method, that to him, gives the best results, and by mastering one method, his success will largely depend upon the thoro, painstaking effort with which he follows this course, with occasional exceptions, as his knowledge and experience point out the limitations and defects of his routine.

The choice of method and armamentarium varies widely; but, regardless of the method used, the general consensus of opinion is that, in the majority of cases, the use of some cycloplegic is advantageous. The prime essential in the fitting of glasses is the measure of the static refraction, and I do not believe this can be done accurately without a cycloplegic. It may be possible to measure accurately the refractive error of a large proportion of cases without a cycloplegic, but it is the occasional case that is transferred from the realm of guess work to the realm of certainty by its use. And it is this occasional case which will make or mar a man's reputation as a good refractionist. For this reason, as well as for the sake of the patient, every method that aids toward scientific accuracy should be employed.

To measure the length of a piece of elastic rubber while in a state of tension is impossible, but, freed from this tension, it has a definite length, which may be measured; and, similarly, the refraction of the eye becomes a definite, fixed quantity when the ciliary muscle is put at rest. To accomplish this, cycloplegics are used, chief among which are atropin and homatropin.

To a questionnaire sent out, Dr. French of Marshalltown received re-

plies from 334 oculists, of whom seventy-four and one-half per cent routinely used atropin in children and homatropin, routinely, in adults.

My own practice has been to use homatropin, in adults, and atropin almost exclusively in children, using one per cent, three times per day for three days. Homatropin is used in solution (six grains to the ounce), one drop in each eye every fifteen minutes for three to five doses, depending upon the age of the patient, upon his refraction by the preliminary test, and his power of accommodation. In patients near and over forty years of age, I use only three drops of one and a quarter per cent homatropin at fifteen minute intervals, refracting them beginning fifteen minutes after the third drop.

After repeated try-outs, I have not been able to get my patients to accept a stronger correction, either plus or minus, by using more of the cycloplegic, or by waiting a longer time.

At the termination of the examination, all adults are given one or two drops of eserin solution (one grain to the ounce), for two reasons, first, as a matter of safety, and second, to make them more comfortable and lessen the time of their disability from lack of power of accommodation.

In regard to the first reason, we should not let pure zeal or desire for scientific accuracy blind us to the fact that unfavorable results do occasionally follow the use of cycloplegics. Chief among these, is glaucoma, which altho a slight is none the less a real danger. This, however, is almost, if not entirely, preventable by the use of eserin.

There is one complication, which, however, is even more rare than glaucoma, judging from the fact that I have not been able to find a record of such

a case in the literature. The following case is illustrative of this condition.

F. W. B. Male. Age 36, came to me on Feb. 2, 1923, complaining of pain or headaches in the back of his head, worse after doing close work. His vision had never been good, but he did not see that it was any worse than it had been for years. He had never worn glasses. His vision was R. E. 20/100 plus; L. E. 20/40. He was given one drop of one and one fourth per cent homatropin in each eye every fifteen minutes for three doses; then after twenty minutes his refraction was, R. E. +1.50s. with +.50 cy., ax. $95^{\circ}=20/40$.

L. E. +1.50s. with +1.00 cy., ax. $85^{\circ}=20/30$.

Ophthalmoscope showed numerous fine opacities on the posterior capsule of the right lens. Fundus, negative in each eye.

There was no history of injury, or of any previous inflammation of the eyes. His tonsils showed slight congestion of the pillars, and a caseous exudate was expressed from the crypts.

He was given for constant wear his correction under homatropin, with plus .50 sphere subtracted, and as he was going out of town, and anxious to recover as quickly as possible from the mydriatic, I instilled two drops of eserine solution, (one grain to the ounce) in each eye.

To my astonishment, five days later he returned and said he still could not see to read even large print. I again used eserine freely.

On Feb. 12th, his pupils were normal in size, and reacted to light, but not to accommodation. As it was very necessary for him to do some close work, he was given a temporary pair of reading glasses with +2.50 sphere added to his distance correction.

Further examination showed two dead teeth, and a skiagraph also showed a slight clouding of the right antrum. The teeth were extracted and I drained the right antrum, finding a small amount of stringy pus; and he was put on eserine (half grain to the ounce) three times per day and strychnin sulphat in gradually increasing doses up to a maximum of one-tenth

grain three times daily, and continued for about six weeks. He was referred to an internist for physical examination, which was entirely negative, including the Wassermann test, and differential blood count.

On March 19th, a tonsillectomy was done, hoping to thereby eradicate every possible focal infection.

April 1st, there had been no improvement, and he was given kryptok bifocals, with his full correction under homatropin for distance and a plus 2.50 sphere added for close work. These he is wearing at the present time with entire satisfaction.

One interesting feature in regard to the use of the eserine in this case is that, about twenty minutes after each instillation, he is able to read ordinary print without his glasses for a short time. However, after several weeks, this disappeared and it was discontinued for two weeks and begun again with the same effect. He still uses it at intervals, as he says the eyes "feel better" when he uses it.

In presenting this case for your consideration, I am at a loss to offer any explanation of the causes of the paresis which appears to be permanent in this case. In my search of the literature, I have been unable to find a report of a single similar case, and in considerable correspondence, I have heard of only one other case, which Dr. Gifford of Omaha tells me he saw in consultation, a number of years ago, and which was permanent so far as he knows, the patient being under observation for two or three years.

In regard to the homatropin used, will say it was a comparatively fresh solution of Squibb's make, and the solution was used for other patients without any unfavorable results.

A number of men have reported uncertain or prolonged effect of homatropin which was believed to be due to some impurity of the product, but I do not think this could be the cause in this case.

I am bringing this to the attention of this society in the hope that, if other cases have occurred, perhaps by comparison, we may be able to determine

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the cause and be informed as to the prognosis and treatment, or possibly determine some condition which might be definitely observed as a contraindication for the use of homatropin, or other cycloplegics and thereby escape the, to say the least, very unpleasant

experience of transforming a young adult into a presbyope.

Note—At this date, April 24, 1924, the paralysis of accommodation is still complete and the patient still wears the same correction for distance and near work with complete comfort.

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HAAB'S MAGNET IN OPHTHALMOLOGY.

A. E. HUBBARD, M.D.

BUFFALO, N. Y.

After some account of the giant magnet and its introduction and earlier use, the writer records his own experience and conclusions, having found it the only type it was necessary to use. The general technic of magnet extraction with this instrument and certain special manipulations to insure success are described. Read before the Buffalo Ophthalmological Club, Feb. 14, 1924.

In presenting this paper, I am going to confine myself to the description and discussion of the Haab or so-called giant magnet, as this is the only type I have used or found it necessary to use. I am aware, of course, that the hand magnet is of great value and that it is preferred by many, in certain cases, to the larger form; and while speaking of hand magnets, it is with pride that I am able to say that at least two of our members have devised some of the best of this type. It is to the credit of our club that in 1884, Dr. Alvin A. Hubbell made one of the best used at that time, and later our mechanical genius, Elmer E. Starr, also produced one of this type that was very powerful.

In 1892, at the meeting of the Ophthalmological Society at Heidelberg, Haab presented his "Giant" magnet, which was the most powerful form that had been produced. Haab's magnet was designed to overcome the necessity of bringing the magnet in contact with the foreign body. As is well known, the force of any electromagnet decreases rapidly as the object is removed from the center of the magnet's pole, and this fact made it necessary to approximate closely, if not actually to touch, the tip of the small magnet to the foreign body.

To operate a giant magnet, it is necessary to have a direct current of

about 110 volts which may be furnished by a dynamo, or directly from the street current of 110 volts. When neither of these are obtainable, and as most of the electricity furnished in Buffalo is alternating current, it may be necessary to use a rectifier. These are of two types, namely the rotary and the electrolytic.

The magnet should be provided with a rheostat, so that the force of the current can be regulated, also a switch, so that the current can be turned on and off as required. Haab now has a switch which he controls with his foot, so that the current may be very quickly cut off should it be necessary.

The first Haab magnet to be installed in Buffalo was at the Buffalo Eye and Ear Infirmary in February, 1900. As the only direct current obtainable near there was 500 volts, there was installed a bank of electric light bulbs on a panel in the wall to reduce the current to 110 volts. This gives a wonderful illumination when using the magnet, which is very useful, as it allows the eye to be kept under observation without the use of any other light or condensing lens. The Charity Eye and Ear Infirmary was the next to install a giant magnet, and since then most of the general hospitals have followed suit; during the war I had one installed at my office.

In the days before we had the Work-

man's Compensation Law, the magnet was used much more for diagnostic purpose than today. At that time, most of our steel cases were patients not able or not willing to pay for an X-ray examination and, as it was impossible to tell in many cases the size or shape of the foreign body, it was of the utmost importance we take every precaution possible, when using the magnet for diagnosis, to avoid injuring the eye further by its use.

It was after experimenting with pieces of iron of different sizes and shapes, that I found by gradually bringing a piece of iron, that was longer than its other dimensions, into the field of the magnet, it would become polarized and point toward the magnet. As a result, with every case, I would start with as weak a current as possible and bring the patient from some distance slowly toward the magnet: this allows the steel to become polarized, and there is no possible chance of the steel, if a large piece, suddenly jumping forward bringing the iris with it, as had occurred with others when they started with the eye close to the magnet and the current on full. I also found that if I made a permanent magnet of a piece of piano wire and suspended it on a fine thread, it would act as a crude sideroscope, and by its use one could demonstrate the presence of a piece of steel, if of fair size, and by its action obtain some idea of its bulk.

When using the magnet for diagnostic purposes, I think it best not to use any local anesthetic, as the patient's eye will be more sensitive to any reaction. Today I have most of my suspected steel cases X-rayed, occasionally I use the magnet first. But I do not agree with Haab when he says the use of the X-ray is useless, since the magnet seeks the body wherever it is.

In my industrial work I have found it very convenient to have a giant magnet at my office, and I use it more often for the removal of steel from the cornea, conjunctiva, subconjunctival tissue, lids and face than I would if I had to go to a hospital with these cases, with better results for the pa-

tient and a saving of considerable time for myself.

I find that it is never advisable to take the patient's word that a foreign body has not entered the globe, and when I find an injury which suggests such a possibility, even if the media are clear and a foreign body cannot be seen, I have an X-ray made and have found in numerous cases this would tell a different story. The same applies in old cases where the lens is opaque. Small pieces of steel are less apt to set up an inflammation of the eye, not so much on account of the size, as due to the force necessary to break them loose, as considerable heat is generated in these pieces, thus helping to make them sterile.

It is well to remember that we cannot get an accurate idea of the size of the foreign body from the size of the wound, as long splinters have a tendency to strike the eye end on, making but a slight wound.

After it is definitely determined that there is a piece of steel in the globe, immediate removal is essential as it is more easily extracted before clots and connective tissue have surrounded it; also there is less danger of inflammation if removed at once, altho I have removed steel that has been in the globe years, with excellent results.

In the removal of a piece of steel from the globe, I prefer to manage the patient's head myself, but have an assistant attend to the rheostat and switch. The more gently the foreign body can be removed from the eye, the better the result, and as I said before, *start with the weakest current and with the patient's eye some distance from the magnet and bring him gently forward.*

Every case must be considered a law unto itself. If the particle has entered the globe without injuring the lens, it is very important to try to remove it without impairing the vision. Here its size and location have to be very carefully considered. In most of these cases, I believe the anterior route is the one to be preferred. Place the tip of the magnet, so that its line of force will be directed from the margin of the

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lens to the steel, so as to bring the steel forward thru the suspensory ligament, thus avoiding injuring the lens; also try to keep it from becoming entangled in the ciliary body. When thru the suspensory ligament and in the posterior chamber, I have the current turned off, the patient looks down and the tip of the magnet is placed at the upper margin of the cornea. Start with a very weak current, endeavoring to draw the steel up thru the pupil into the anterior chamber. At times this is very easily done if the particle is a smooth one, but if irregular with sharp points or edges, it has a tendency to become entangled in the iris and may take considerable manipulation of the eye and magnet to bring it into the anterior chamber. It is in these cases that the old type of Haab magnet with a tip at either end is invaluable, as the piece of steel, after the use of the magnet, becomes polarized, so if we reverse the magnet and use the other tip the steel will be attracted from its opposite end and as a result of this, roll upon itself and at times will loosen and come forward into the anterior chamber. The same reversal of poles of the magnet, with the single tip, may be brought about by reversing the wires furnishing the current.

After the steel is in the anterior chamber, if the case be a recent one, I endeavor to remove thru the point of entrance. If this is impossible, I do a paracentesis and remove thru this opening.

Occasionally I have had cases in which I have not been able to disengage a piece of steel from the iris as described. In these cases I have made a small tip from a brad, giving it the necessary shape by filing and bending. It is sterilized in an alcohol flame. Attaching this to the tip of the magnet, it is introduced into the anterior chamber thru an incision and the chip removed in this way. As the tip made from the brad is short, we lose very little power, and as the end applied to the magnet tip is small it is freely movable on it.

I feel that I cannot emphasize the fact too much, *that we should at all*

times use the weakest current to start with and gradually increase as necessary; and the very instant the patient feels any pain reduce the current. It is also well to remember, that the larger the piece, the greater its attraction; and also, as steel approaches the tip of the magnet, it is more powerfully attracted.

In those cases in which the lens has been injured by the entrance of the steel, I apply the tip near the wound in the cornea, and if the steel is of any size it will often come forward at once thru the point of entrance. If it does not, I apply the tip near the lower edge of the cornea and as the steel will follow the path of least resistance, when it has come forward it will slide around the lens thru the suspensory ligament into the posterior chamber, and then can be removed as before.

It has occurred, occasionally, that the piece of steel that has entered the globe is so small (and it is surprising how small a piece of steel will penetrate the globe) or has become so embedded in the tissues, that I have had to work hours before I have been able to remove it. But so far I have had the satisfaction of always having been able to do so. In these difficult cases, I have practiced the reversal of the poles and have also found that when the constant current would not loosen the particle, I have been able to do so by having the current turned off and then on, repeatedly; and that the sudden jerks would loosen the steel so that it could be removed.

It is very desirable to keep the steel from becoming entangled in the ciliary body, because, besides the injury it does, it is very hard to disengage. When this has occurred, I have been able to dislodge it by having the patient look up and placing the tip in the lower cul de sac.

In the majority of my cases, I use the anterior route, but in some cases the scleral route is to be preferred, or is necessary. If the piece is large and has passed thru the sclera, I think that less injury is apt to occur if removed thru the original opening; also in cases in which the piece is so

small, or has become so firmly embedded, that after repeated trials I have not been able to bring it forward. In these cases, after making a conjunctival flap to cover the wound, I make a longitudinal scleral puncture as near the steel as possible and then endeavor to remove by placing the sterilized tip of the magnet near the opening.

If after repeated trials this fails, I have, as a last resort, made use of a small tip made from a brad, and removed the steel by introducing this sterilized tip into the vitreous. In these cases, before making the scleral puncture, I always have a second X-ray made so as to relocate the steel if it has moved.

Pieces of steel, that have only penetrated the anterior chamber or have become entangled in the iris, are removed as described before.

When located in the lens they are usually easily brought forward and removed. Even in old cases with mature cataract, I prefer to remove the steel first and the cataract afterwards; as there is danger of the lens breaking up in its removal with the possible loss of the steel.

In corneal cases, with the steel deeply embedded, I have had considerable experience, and at first had difficulty in their removal. When a piece of steel becomes embedded in the cornea, I think that we can compare it with a bullet shot into a piece of rubber, as in both cases the object makes a very small opening compared to its size. Hence, in trying to remove a piece of steel deeply embedded in the cornea, with a fine pointed spud or knife, we are apt to cause considerable injury to the cornea with the resultant scar. In these cases, I found, if I placed the tip of the magnet to the wound, that it had no more effect on the steel than it would have on a piece of glass. So I made a number of tips from small brads, some pointed and

others chisel shaped, and found by introducing the tip of one of these into the wound I could remove the steel. In these cases I afterwards found that a rust spot remained in the cornea which retarded healing.

Now, before using the magnet in corneal cases, I make a cross incision with an iris knife, down to the steel; and find that it can be readily removed by applying the tip of the magnet to the incision and that the cornea heals quickly with little if any scar.

The text books tell us to be very careful in making an incision down to a foreign body in the cornea, as there is danger of pushing it into the aqueous, but this, I think, is more fanciful than real as the cornea is very tough. But if we did push the steel thru the cornea, I think there would be less injury to the eye in removing the steel from the aqueous, than there would be in attempting to remove it from the cornea without an incision.

When a piece of steel has penetrated the conjunctiva, or is embedded in the conjunctival tissue or sclera, it is at times readily removed by placing the tip at the point of entrance; or if not, by loosening the tissue about it and then applying the magnet it may be removed.

Some years ago, while slitting a stricture in the lacrimal canal, the patient jerked her head breaking the blade of a lacrimal knife leaving part in the canal. This I removed after I had bent a wire nail and introduced it into the canal, then applying the magnet to it.

In ending I will but mention that most steel splinters are magnetic, but there are a few of the new alloys containing manganese in certain proportions, also some containing manganese and nickel, that are practically nonmagnetic, but from these so far I fortunately have escaped.

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OCULAR MANIFESTATIONS OF TRAUMATIC NEUROSES.

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The recent literature of this subject is here reviewed, especially the reports of cases arising from the great war. Such neuroses do not arise in strong healthy individuals. Fatigue and starvation are important and exciting causes. Most cases recover rapidly with food, rest and encouragement. Hospitalization is contraindicated. Where several hysteric manifestations are noted vision returns first.

A mental or emotional background is essential for the production of a neurosis, especially the traumatic type. A review of the war literature clearly demonstrated the presence of a pre-war nervous instability, in cases which developed neurotic symptoms.

Disturbances of a psychoneurotic order followed severe mental and physical strain, the witnessing of horrifying scenes such as the killing of relatives and friends, or the presence of an uncontrollable fear or emotion. They were fairly common in base hospitals, but never among men who had been severely wounded. When seen at the front, they were in soldiers who had received no injuries.

Meier and Muller¹ said traumatic psychosis or neurosis depended on the following conditions. 1. A general psychopathic disposition. 2. Internal conflicts of various orders such as personal discouragement or sexual weakness. 3. An unbearable situation produced for the victim by an accident. 4. Fear, deep down in his soul.

Reid² in analyzing 3,000 cases, stated that psychosis of war differed from that in civil life. The former was due at times to physical exhaustion, but usually to a mental background such as dementia precox, mental debility, and states of great mental depression. Roeper gave the name traumatic psychopathic constitution, to those receiving brain injuries resulting in mental changes, such as alteration in disposition with intolerance for thermic, toxic, acoustic, and optic stimuli.

One must exercise caution in classifying cases of cranial trauma, to eliminate such conditions as lues, epilepsy and alcoholism, all of which may complicate the diagnosis. Gazamalli³ referred to the question of grave psychomotor excitation, in which the soldier had visual and auditory hallucinations

of a fashion perfectly opportune and coordinated. Under the sway of these hallucinations, his conduct reproduced exactly the reactions present previous to any incident of war. Gazamalli believed it was a special malady of the sensorial cortical zones, brought on by powerful, violent and incessant excitations.

Hadley⁴ on the other hand, said there was no clinical entity which could properly be called traumatic neurosis, but there was a change in the personality, which might be called posttraumatic constitution. In this state certain ocular manifestations might be found, such as optic neuritis, irregular contraction of the visual fields with interlacing of colors, scotoma, muscular imbalance, paralysis and diplopia. Other ocular conditions which might be present are amaurosis, amblyopia, mydriasis, erythropsia, muscae volitantes, blepharospasm and nystagmus. These symptoms usually occurred in individuals who possessed a weak nervous mechanism, or in those who suffered from fatigue, starvation and inanition.

By some observers this condition was considered a means of self defense or preservation, assumed by those who lacked the nervous and moral fiber to resist the rigors and privations of war. Few cases of neuroses were observed among crack regiments, with traditions to uphold, or among nurses. It was less frequently seen among officers than privates. It was never present in prisoners or wounded soldiers, according to Ames⁵, who said the immediate exciting cause was emotional or physical, such as aeroplane raids, mine explosions, anticipated explosions or gas attacks. The factors of fear and suspense were contributory, but most important in etiology was fatigue. The symptoms usually appeared some time

after the shock. The patient might have recovered from an unconscious state, and apparently have been normal for several days, when he would develop mutism, blindness and tremors. The condition would reach its maximum in twenty-four hours and then recede, once the patient was cared for.

Symptoms may be divided into two groups. 1. Those dependent on neurotic conditions, such as traumatic psychoneuroses. 2. Those resulting from organic changes in the nervous system. In the latter class there may be symptoms resembling those due to localized or diffuse lesions, and simulating certain organic nervous disorders. Pitres and Marchand referred to cases of pseudotabes, and pseudoparesis. One case with meningeal symptoms, which came on three days after the bursting of a shell, consisted of ptosis, internal strabismus and mental disorders. Another suggested tabes with Argyll Robertson pupils, Romberg sign, and loss of patellar and achilles reflexes. Bergl⁶ saw a case of bilateral Argyll Robertson pupils, which followed the explosion of a mine, with no apparent injuries. Similar cases were reported by Finkelburg and Axenfeld. Lues was eliminated, and the sign disappeared within three weeks. It was thought to be due to a lesion of the gray matter in the region of the Aqueduct of Sylvius.

J. Ramsey Hunt⁷ described a condition closely resembling early paresis, which was found in men who were terribly fatigued. He cited one case which was mentally dull, had slight nystagmoid twitchings in extreme lateral positions, marked facial and lingual tremors, tremulous speech, and in which the pupils were partially dilated and unequal. These symptoms coincided with the clinical picture of early paresis, however, after rest in bed they all disappeared. The condition was considered one of acute exhaustion of the cerebrospinal centers. He believed there were fatigue toxins acting especially on the sympathetic fibers, which produced the pupillary changes. Lowy⁸ referred to the peculiar mental state of Austrian officers, who had suffered

reverses and privations in the Serbian Campaign. They were pessimistic, had increased knee jerks and narrowing of the visual fields, all of which disappeared after rest, food and regaining of lost flesh.

Vincent said hysteria was never seen at the front in the presence of bursting shells, and the killing of men. Emotion only was encountered. Hysterical symptoms appeared when the patient had passed thru danger, and was in a place of safety. Hysterical blindness of four years duration, in a gassed case with a head injury, was considered hopeless, having been erroneously diagnosed optic atrophy. He wore dark glasses and could only distinguish light from darkness. His discs and fundi were normal. Hurst and Roberts⁹ who made the correct diagnosis of hysteria, were able to make him see within an hour, by persuasion and encouragement, telling him he was going to be completely cured. Ten days later his vision was 6/5 in each eye.

Grasset¹⁰ in discussing psychoneurosis of war said that frequently a soldier thrown several feet in the air, would awake from an unconscious period and find himself deaf, dumb and blind. Vision was the first faculty to reappear and speech the last. The etiology was due to concussion. Most cases recovered, but hospitalization was contraindicated. Amaurosis was the most common symptom of psychoneurosis observed in the British navy, frequently accompanied by deafness, dumbness, and complete blindness. Sight usually returned first.

A rare form of nystagmus was encountered by Jeandelize and Lagarde¹¹ following the bursting of a nearby shell which produced no visible injury to the patient. Periods of lateral nystagmus with rapid excursions lasting 18 to 23 seconds, were followed by periods of repose. At times the periods of nystagmus were longer, and during them a tight closing of the lids, with a spasm of the orbicularis, was often noted. Vision was normal during the quiet state, but markedly reduced during the periods of nystagmus, while the fields were contracted. The

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condition was considered a neurosis, of emotional origin.

Numerous cases of neuroses developed ocular conditions many months after the accident, which was claimed to be the etiologic factor. This was well illustrated in a case reported by Hansell, who had under his care a patient gassed in France several months previously, who claimed to be totally blind. All examinations were negative. The upset of his nervous system, induced by his experience in France, was intensified by domestic troubles and complete destitution. Under treatment and encouragement, recovery ensued.

Some authors claimed that although hysteria was not psychoneurosis, it might enter and absorb the latter. Signs and symptoms were excitability, difficult speech, sensory and motor troubles, aphasia, tachycardia, dyspnea and vomiting. Ocular manifestations, according to Belhague¹², were diminished vision, contraction of the fields, amaurosis, photophobia, nystagmus and blepharospasm. He thought the causative factor was probably a direct or indirect commotion, plus emotion in a neuropathic subject.

An interesting case of spasm of accommodation studied by Rochon-Duvigneaud, occurred in a sentinel while on guard duty, who suddenly lost his vision. He was highly nervous and the condition was diagnosed psychic blindness and hysterical amblyopia. Examination showed convergence, contracted

pupils, and normal fundi, also a high myopia of -12 diopters. Under mydriatic his refraction became slightly hyperopic in one eye, and slightly myopic in the other. A postmydriatic examination showed the myopia to have returned. The author considered it a purely functional case, brought on by emotion in a neuropathic subject.

Exaggeration of the oculocardiac reflex was often observed in functional disturbances, and was thought by certain writers to indicate a vagotonic manifestation.

COMMENT. It is a striking fact in studying neuroses, that no cases were observed among those who possessed a high morale, even tho subjected to privations or grave danger. It was essentially a condition of the weak, and in many cases, a means of last resort for self protection. The literature showed the exact nature of this condition to be somewhat obscure.

CONCLUSIONS. 1. Neuroses never developed in normal, healthy, strong individuals, or in prisoners and wounded men.

2. Fatigue and starvation were the most important exciting causes.

3. Most cases recovered rapidly with rest, food, and encouragement, plus massage, hydrotherapy and electricity.

4. Prolonged hospitalization was contraindicated.

5. Of the several hysterical manifestations present, vision returned first.

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MARGINAL ECTATIC DYSTROPHY OF THE CORNEA

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Terrien's description of his cases is quoted and an account given of the author's case followed for ten years. The cornea near the periphery becomes thinned and then bulges without any ulceration. The ectasia is generally more or less opaque. Cases have been reported in every decade from ten years to old age. Read before the Seventh National Medical Congress of Mexico.

One of the most rare and curious affections of the cornea is that which was described by Dr. F. Terrien, in the Archives d'Ophtalmologie of 1900, under the name of "Symmetric Marginal Dystrophy of the Two Corneas," of which there has just been published a second paper, in the same Archives (1921, p. 523), modifying slightly the name: "Ectatic Marginal Dystrophy of the Cornea."

As Dr. Terrien has observed in his last work, that he was scarcely able to collect from all the ophthalmic literature, a dozen cases, including his first case, I thought that it would not lack interest to describe one more case, which I had the opportunity to observe over a period of ten years, during which time I was able to watch the progress of the astigmatism and the various aspects which the lesion offered.

Before relating my observation, I think it necessary, to establish comparisons, to make an extract of the two cases of Dr. Terrien, indicating later any differences that have been observed in the cases of other authors.

CASES OF TERRIEN.

1. Subject, age 45 years, without syphilitic history. In both eyes were observed, in the center of the superior periphery of the cornea, near the limbus, a band of transparent tissue, irregularly humpy, rising above the surface of the cornea and separated from the rest of this membrane, as from the side of the limbus, by a delicate groove irregularly festooned. The band of transparent tissue and ectasia had the form of an arc of two mm. in width in its center and terminating in a point at each extremity. This ectasia, almost equal in the two eyes, caused an inverse astigmatism of 11 D. which compelled the patient to cease his occupation during nearly two years, by so markedly lessening his vision.

Under the influence of a series of superficial cauterizations with the fine point of an actual cautery, the astigmatism decreased from 11 D. to 1 D., and the visual acuity rose from 1/50 to 1/3, allowing the patient to read with -3.50, the finest characters.

CASE 2.—Individual of 46 years, without previous history of any kind, having always had good vision; with Bordet-Wassermann negative. In July, 1917, in the trenches, he suffered contusions of the left arm and of the face, from a shell explosion throwing smoke and dirt into his eyes. His recovery was rapid, but the patient referred to this trauma the failing of his vision, which had been progressing to the point where he was obliged to consult someone.

The visual acuity was 1/10 O. D. and 4/10 O. S., the ophthalmometer revealing an irregular astigmatism of 12 D. in O. D. and 10 D. in O. S. In both corneas there existed an ectasia, which reminded one of the lesions in the first case. In the right eye was seen at the upper part, within the limbus, a transparent ectatic band of 2 mm. width in its center and terminating in a point at its extremities, limited by two grayish grooves, more marked on the corneal side. In the left eye, there were two ectasias, more marked, one between 9 and 2 o'clock, the other between 6 and 9. There was no inflammatory reaction and the fluorescein test was negative in both eyes. Sensation was abolished in the ectatic parts, while the rest of the corneal reflex was normal. Pupillary reflexes and fundi of both eyes normal. There were no disturbances of sensations (reflexes) and no signs of tabs.

AUTHOR'S CASE.—The case to which I am going to refer seemed to me interesting because I was able to follow the observation from the year 1912 until 1921, when the patient was lost sight of.

When, in 1912, I saw him the first time, he was a young man of 22, dedicated to his tasks of ranch life, as a foreman, in one of the haciendas of the State of Guanajuato. He came to complain of bad vision in both eyes.

The exterior of the two eyes was normal, with the exception which I shall point out later. The corneas were transparent, the anterior chambers of normal depth, the irides normal, pupillary reactions physiologic, media transparent, the fundi of each eye without the slightest appearance of pathology. Movements and synergies, normal. In each eye, I found by retinoscopy a mixed astigmatism at axis 60° , $+2.50$, ax 150° — 3.00 . In the O. S. ax. 150° was hyperopic $+2.50$ to myopic -2.00 D. in opposite axis. The visual acuity was $3/10$ in both eyes rising to 1. with the following O. D. -3.00×60 , O. S. -3.00×160 .

Besides all this, which presented nothing extraordinary, the right cornea presented a very curious lesion; between 9 and 1 o'clock, very close to the limbus, there existed a transparent band of the cornea, depressed, in the form of an arc, limited on the pupillary side by a delicate gray wavy groove, which separated the rest of the normal cornea from the lesion, while on the scleral side there was no precise line of demarcation. The width of this band of altered cornea was 2 mm. in its widest part and terminated in a point at each extremity. All the surface of the lesion was brilliant altho slightly irregular. The cornea appeared as a broken watch crystal. The depression of the band was not uniform except that it was more accentuated near the gray furrow. There was no inflammatory reaction or any subjective symptoms. There was no staining with fluorescein. Sensation was notably diminished at the level of the lesion, remaining normal in the rest of the cornea.

According to the history of the patient, he had already had this lesion for some time when I first saw him, altho he had had no treatment and had no preceding pain. He did not know what causes had contributed to produce it.

The patient was lost sight of for three years, and in 1915 I saw him again. The lesion had increased in width, without losing its anterior aspect, excepting that in its center it was slight ectatic. The left eye remained normal, showing the same refraction as in 1912. But the right eye was more astigmatic. The myopic meridian which followed the direction of the diameter of the arc formed by the band of altered cornea, had risen from -3.00 D. to -5 D. The patient presented no sign of any other illness. The Wassermann, which was made in one of the most competent laboratories, was negative. The intradermal reaction to tuberculin was also negative.

The progress of the lesion made me propose to the patient the use of the actual cautery; but he would not accept this, and I prescribed a new glass for the right eye whose formula was -5 . cylinder axis 60° .

In the space of three years I did not again see this patient. In August of 1918, he again presented himself, because the vision of the right eye had diminished considerably. The left eye remained normal except for the mixed astigmatism which had shown from the beginning, and which had not increased. In the change in the right eye, the lesion had increased considerably in width, while its length had not increased. The part of altered cornea which remained transparent with the exception of the gray groove, which separated it from the rest of the normal cornea, was no longer a band, but a zone which extended from 9 to 1 o'clock, and from the limbus to within a mm. of the pupil border (the pupil in moderate dilatation); having in its greatest width 4 mm. being narrower at its extremities. The ectasia was more noticeable. The surface remained brilliant, altho irregular and without doubt covered by epithelium, since as at previous times, the fluorescein test remained negative. At the level of the lesion sensation was abolished, remaining normal in the rest of the surface of the cornea.

As foretold by the increase in the ectasia of the dystrophic zone, the

myopic astigmatism had increased; the oblique meridian which crossed the lesion was shown by retinoscope to be -7.00 D., that is to say 2 D. more myopic than in 1915 (3 years before).

He had no pericorneal reaction at the time of examination. The patient said that the eye now reddened.

In 1921, I took occasion again to examine this patient; the dystrophic zone had increased 1 mm. in width, the myopic astigmatism had risen from -7.00 to -9.00 D.

Altho the patient accepted the proposal of actual cauterization, I have not put this into practice because he had not returned to present himself at my clinic.

COMMENT.

As Terrien had very justly observed, the lesions could not be considered as the result of any ulceration. Never in my patient had there been any pericorneal injection, never any pain, never had I been able to discover the least loss of epithelium, since as I again repeat, the fluorescein test had always been negative, besides all the altered zone had always been transparent.

Prof. Terrien shows the difference between his observations, in which the ectasia had always been more or less accentuated and never had had a groove (furrow), and those of Fuchs and other German authors, in which this groove, this depression, channeled out, had always been observed. This led Prof. Terrien to suppose that the affection described by him under the name of "Symmetric Marginal Ectatic Dystrophy of both Corneae" and the cases observed by Fuchs and other authors, belonged to two distinct varieties of corneal degenerations.

From this point of view, the case which I have just related seemed very interesting since from the first time that I had observed my patient, all the band of altered cornea was depressed, the surface brilliant altho irregular, and completely transparent. The depression was more accentuated near the gray groove.

The dystrophic zone became ectatic only little by little, during the passage of the years, as if the ectasia was the

result of the diminution of the resistance in all the altered zone. I do not hesitate to consider the depression as the first step, and the ectasia as the second, in the same dystrophic process.

The histologic examinations which Dr. Fuchs was able to carry out in one of his patients, demonstrated that at the level of the lesion the cornea was very much thinned, that the number of lamellae was considerably reduced, transforming the membrane of Bowman in some places into a loose tissue, fibrillar and rich in nuclei. This could explain the depression in the beginning, and the ectasia which presented later, by diminution, at this place of the resistance of the cornea.

In respect to these investigations of Prof. Fuchs, Dr. Morax says, in his beautiful book "Ocular Pathology" (Paris, 1921), the following: "Fuchs has called attention to one complication that is possible in arcus senilis, characterized by a depression situated at the level of the arc, of which it can occupy only one part, and which gives the impression of a loss of substance, but demonstrating by the fluorescein test the absence of any ulceration properly speaking." He afterward describes the histologic modifications which I have just pointed out, adding: "It happens at times that the extension of the corneal thinning occurs to such a degree that in place of the depression an ectasia is produced."

Indeed, the patient of Fuchs, a subject of 63 years, presented in both eyes, a depression, a marginal groove, almost circular in the right eye, and limited to the lower portion in the left; which had lost sensation on the sclerotic side, while the internal side was limited by a very pronounced arcus senilis. As the arcus senilis was formed by the gray degeneration peculiar to these lamellae of the cornea, and in a case of Seefelder all the lamellae which formed the floor of the depression were full of gray granulations, he had concluded that the marginal dystrophy of the cornea held strict relation with the special gray degeneration which constitutes the arcus senilis.

Against this presumption of histologic chemistry is raised the clinical

evidence. The two patients of Dr. Terrien are relatively young men, the first was 45, the second 46, and neither presented gerontoxon. My patient emphasized that he had suffered his corneal affection during his adolescence, and he did not have in either cornea the least indication of arcus senilis, a name which in his case would be inappropriate.

My observation gives support to the opinion of Dr. Terrien which denies all similarity between the gerontoxon and the marginal ectatic dystrophy of the cornea.

As the gerontoxon is of such frequent occurrence, it is not surprising that we should find both corneal degenerations in the same case, but this in no manner signifies that one depends upon the other.

I do not wish to depart from the flat-footed attitude on the point of the affection being unilateral in my case. It is ordinarily bilateral, altho not always of equal extent in both eyes.

Nor is my case the only one in which the cornea affection has been disclosed in one eye only: In the Society of Ophthalmology of Paris, Drs. Rochon-Duvigneaud and Ducamp presented in 1913, a young man of 17 years, who has shown the lesion which we are studying in only one eye. The case of Dr. Passera and the two of Dr. M. Marquez are unilateral.

From the standpoint of the long duration of the affection, my case is particularly interesting, then, since I was able to observe it from 1912 to 1921, and the patient stated that even in 1906 an oculist (I cannot say who) had called his attention to his affection.

Another case of Dr. Marquez, published in *Espana Oftalmologica*, also demonstrated the slow and progressive evolution of the affection, since the subject, 46 years of age, had shown a dystrophy of the cornea since 10 years old. Only in one case, the second of Rubbrecht, was there development of this condition in a few weeks.

It seems worth while to note that these marginal dystrophies of the cornea can be observed in all decades of life. The patient of Rochon-Duvigneaud and Ducamp was 17 years old. My patient when I first saw him was 22 years old; but the condition probably had begun at 16. The patient of Dr. Marquez presented the first signs of the condition at ten years. That of Milton H. Schutz, was a young man of 18 years. The two patients of Terrien were 45 and 46 years. The first patient studied histologically by Fuchs was 60 and the other 70. The case of Van Duyse was in a man of 70 years. The second eye studied histologically by Seefelder, was enucleated at the age of 76 years. The two patients of Rubbrecht were 38 and 60 years old.

It seems then, that marginal ectatic dystrophy of the cornea does not belong only to advanced age.

I wish to draw attention for the sake of pathologic study of this condition, to the fact that almost all the cases observed have been in the masculine sex. In all the bibliographic investigation which I was able to carry out, I found only one case, that of Wm. Zentmayer, in which the marginal dystrophy of the cornea was seen in a woman who, when she was observed by Zentmayer, was 48 years old.

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NOTES, CASES, INSTRUMENTS

ADJUVANTS TO MAGNET POINTS FOR EXTRACTION OF FOREIGN BODIES FROM ANTERIOR CHAMBER AND IRIS.

WM. H. CRISP, M. D.

DENVER, COLO.

The note by Burton Chance, in the January issue, under the above title recalls a case in which I found it very practicable to withdraw a steel splinter from the anterior chamber by using the lance keratome as a magnet point. The patient, a farmer aged thirty-two years, had on September 6, 1922, been pounding a mowing machine sickle, when a splinter of steel had flown into the right eye. No alteration in vision had been noticed, and the only pain experienced by the patient was on exposure to bright light.

When I saw the man on September 8, the eye was fairly red. A very delicate, slightly irregular splinter of steel, almost as thin as a knife edge, and measuring in its two greater dimensions approximately 2 by 0.25 mm., occupied a fixed location midway between the pupillary margin and the limbus in the upper quadrant. While the splinter had apparently not penetrated the substance of the iris, it was at the same time definitely adherent to the surface of that structure, probably by some very delicate irregular teeth in the sharp edge of the splinter.

After carefully considering what operative procedure was likely to insure the withdrawal of the foreign body with the least inconvenience and undesirable traumatism, I decided to

try the effect of inserting a lance keratome at the limbus in the vicinity of the splinter, and then applying the end of the hand magnet to the handle of the keratome. This was done, the blade of the keratome lying upon the foreign body. When the keratome was withdrawn, the splinter of steel came with it, clinging to the tip of the knife. Healing was entirely uneventful.

LICHEN PLANUS OF THE CONJUNCTIVA.

ALFRED F. LUHR, M. D.

BUFFALO, N. Y.

Lichen planus involving the conjunctiva is very rare. E. Graham Little, (London) in an original communication (*Journal of Cutaneous Diseases*, Oct., 1919), states that he found only one instance of involvement of the conjunctiva, a case reported by Gaucher, in which there was a white ridge on the palpebral conjunctiva exactly comparable to the white lesion of the mouth of generalized lichen planus.

CASE: J. K., aged 75, consulted the writer the latter part of June, 1923, with an inflammation of the right eye. Examination showed the bulbar and palpebral conjunctiva very much reddened and somewhat swollen. The cornea had several minute pin point spots at different points of the limbus.

July 7, patient returned with the eye worse, and complained of considerable itching about the eye. The eyelids showed a number of crimson colored, slightly elevated pin point spots. The bulbar conjunctiva was swollen and on

the nasal side were four or five white, elevated, sago like bodies. He was referred to Dr. Herbert H. Bauckus, under whose care he had been for the past seven years for a generalized lichen planus, and who made a diagnosis of lichen planus of the eyelids and conjunctiva. The lesions of lichen planus on mucous membranes and on

of 2 D. which lasted for over a month and then gradually disappeared. All the while there was no change in the accommodative power of the affected eye, and all the while there was no visible change in the refractive media of the eye. The case was one so wholly unique that it would seem of interest to report its final outcome, even tho

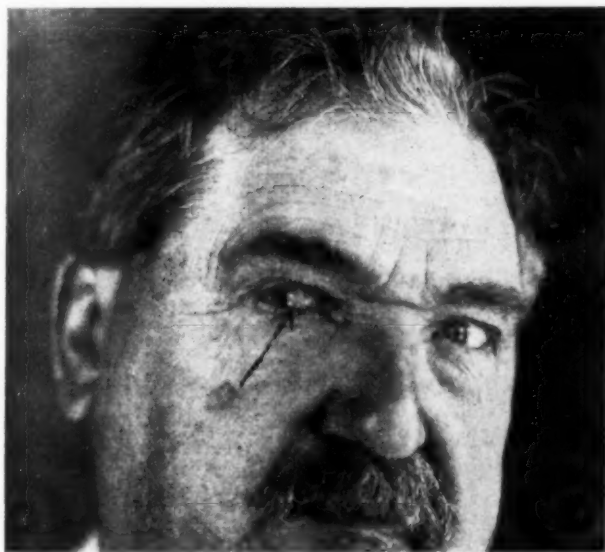


Fig. 1. Lichen planus involving conjunctiva. (Case of Dr. Luhr.) Lesion at point arrow. Pigmented spot at bottom of arrow, marks old skin lesion.

moist surfaces are usually white. The condition was treated by Dr. Bauckus.

After two mild doses of X-ray to the eye (unfiltered ray, one-sixteenth skin unit) the lesions disappeared. There was much improvement two days after the first treatment, and four days later the conjunctiva had entirely cleared up. There have been no recurrences.

FURTHER NOTE ON A CASE OF CHANGE IN REFRACTION.

HARRY FRIEDENWALD, M. D.

BALTIMORE, M. D.

In a previous number of this Journal (Vol. V. p. 803, 1922), the writer reported a case of transient hyperopia; which, so far as he could find, was unique in the literature. The patient, following an extremely mild localized episcleral inflammation developed, in a previously emmetropic eye, hyperopia

it is well nigh impossible to connect in any reasonable way the changes of refraction with the disease of which the patient subsequently died.

The patient was in perfect health for almost two years after the complete disappearance of his transient hypermetropia. In May, 1923, however, he began to suffer with fever, chills, muscular pains and loss of weight. Two months later, in July, he consulted his physician, Dr. Louis Hammon, for these complaints, to whom I am indebted for the following clinical notes.

It then appeared that he had already had a chronic valvular heart disease for some years. As early as July, 1919, Dr had noted a mitral insufficiency, presumably the result of a rheumatic endocarditis. At the present examination, July, 1923, the patient was found to be suffering with subacute bacterial endocarditis due to

streptococcus viridans. He had lost some weight, temperature was elevated 100-103°, pulse 104, respiration 34. Physical examination revealed nothing except the cardiac lesion. Examination of the blood showed a moderate secondary anemia—Hemoglobin 68%, R.B.C. 4,256,000, W.B.C. 5,640, P.H.N. 89%. Blood culture was positive for streptococcus viridans, 10 calories per cc. During the next months the patient's condition grew gradually worse. He became progressively weaker. Toward the end he developed profuse petechiae over the skin. In October, 1923, he died.

The writer realizes the difficulty in linking the eye condition previously reported with the endocarditis of which the patient died, but he feels that to conclude off hand that there can be no relation between them, to conclude that the occurrence of a practically unique ocular condition in association with a rare general disease is merely coincidence, is to stretch the probabilities pretty far, and he therefore feels justified in adding this note to his previous record.

Since the publication of the first note on this case a very similar case has been noted by Dr. Maxwell Langdon. (*Amer. Journal Ophthal.*, 1923, VI, p. 494.)

In this case, too, there was a transient unilateral hypermetropia of about 2 D. with subsequent return to normal. Dr. Langdon suggests that the cause of the trouble might be in vitreous changes, and his case was seen to develop vitreous opacities during the course of the trouble. In the writer's case, however, the vitreous remained perfectly clear thruout.

ACUTE PURULENT ETHMOIDITIS IN A THREE MONTHS OLD CHILD. PERFORATION OF ORBITAL PLATE WITH ORBITAL ABSCESS.

B. M. HOWLEY, M. D.

NEW BRUNSWICK, N. J.

My reason for reporting this case is due to the extreme youth of the patient, its rapid onset and a very satisfactory result from prompt treatment.

Text books on this subject fail to give us very much information about empyema in patients under one year of age. Let me remind the reader that at this early age the ethmoid consists of a great deal of cartilage and that the ethmoidal cells do not really form, until the fourth or fifth year.

In December, 1923, I was called to see a child that was suffering from an exophthalmos of the left eye. The history was that the child who was about 3 months old had a cold for a week, with some discharge from the left side of the nose. Two days previously a slight swelling of the eye had been noticed on the left side.

When I saw the patient there was a marked swelling of the left side of the face, having its center in the region of the lacrimal sac. There was a marked exophthalmos of the left eye, with an orbital cellulitis. There was a sore spot on the gum, to which a membrane was adherent and when it was removed left a raw bleeding surface.

The patient was removed to St. Peter's Hospital where she was operated on the next morning. An incision about one inch in length, starting at the inner angle of the left eye, and going downward and outward. The incision was carried down to the bone, when pus at once showed its presence. The opening was well enlarged and the pus removed. A probe passed backward encountered bare bone of a cellular character, which undoubtedly was in the ethmoidal region. A curved probe passed in the direction of the nose found a free opening. A curved probe passed upwards and outward was able to enter the orbital cavity from which pus seemed to flow.

A small mastoid curet was used and the ethmoidal cell region was cureted in a rather mild manner. It was not considered advisable to make any separate incision in the orbital tissue although the orbital cellulitis was marked. The exophthalmos must have been about 15 mm.

A gauze drain with a wet dressing was applied with an ice bag on the outside over the eye. Examination of pus showed the staphylococcus aureus and the streptococcus, hemolytic type.

The temperature at no time went

over 103° Fah. The next day, the swelling and exophthalmos showed very little change, altho pus was very noticeable on the dressing. The following day the discharge was very marked, and the patient showed a decided change for the better. From that time on the little patient steadily improved, and in a week's time the eye and the orbital cavity seemed almost normal. In about twelve days the patient was able to be discharged, the wound was healed and there was no trace of trouble in the orbit.

NASAL TURGESCECE WITH OCULAR INFLAMMATION.

FRANCIS BURTON BLACKMAR, M.D.
COLUMBUS, GA.

In a detailed search for the etiology of acute iritis, conjunctivitis and dacryocystitis, a turgescence of the nasal mucous membrane on the same side may be reported. A persistent turgescence of the nasal mucous membrane is often considered one of the signs arousing suspicions of an underlying sinus infection. However, a warning has been suggested that, in the presence of acute ocular inflammation, this turgescence may be a reflex effect from the ocular irritation. It may be analogous to the congestion of the lacrimal gland producing the increased lacrimation so constantly associated with ocular irritation. This turgescence may even lead to a secondary sinusitis eventually, if there are acute attacks of ocular inflammation rapidly superimposed. Naturally operative interference with the sinuses in such cases would have very little therapeutic effect upon the ocular disease, except as a help to the general body condition.

MONOCULAR IRITIS FROM A FOCAL INFECTION IN THE NOSE AND THROAT.

JAMES A. MORGAN, M. D.
HONOLULU, T. H.

G. M. White, male, age 26. Seaman by occupation. During June and

December of 1921 he experienced an extremely acute iritis of the left eye. Each of these attacks required several weeks of hospital treatment before improvement was observed. Wassermann tests were said to be negative.

From the time of recovery up to my first examination nothing affected the eye save that it became hypersensitive and watery during the frequent attacks of acute rhinitis that he suffered.

August 31, 1923, he came under my observation, the inflammation then being five days old. His condition being severe he was placed in the hospital. Again, was the Wassermann found to be negative, as was also the urine. No evidence of a previous Neisserian infection was present. Skiagraphs of the cranium showed a marked clouding of the left frontal sinus and ethmoid region, together with an atresia of the left upper and middle nasal meatus. The tonsils were atrophic with deep crypts out of which much caseous material could be expressed.

Under these conditions, and justified because the iritis had persisted, it was decided to operate at once, and a submucous resection was done. The frontal sinus was drained intranasally, and the anterior ethmoid cells were exenterated. There was thick greenish pus in the frontal sinus with beginning polyp formation. The ethmoid cells contained pus, polyps and necrotic bone.

The tonsils were removed at the same time, altho the propriety of removing the tonsils in the presence of so much toxic material in the paranasal spaces was questioned at the time. But all considered it was concluded best to clean the entire field in the one sitting. This conclusion gave rise to no regret, the patient bearing the surgery well and suffering no discomfort, save for a period of twenty-four hours the iritis was intensified.

An eye examination following recovery revealed no permanent defect from the severe inflammation, nor was there any evidence of any of the inflammatory exudate having become organized.

SOCIETY PROCEEDINGS

Reports for this department should be sent at the earliest date practicable to Dr. Harry S. Gradle, 22 E. Washington St., Chicago, Illinois. These reports should present briefly scientific papers and discussions, include date of the meeting and should be signed by the Reporter or Secretary. Complete papers should not be included in such reports; but should be promptly sent to the Editor, as read before the Society.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Section on Ophthalmology.

December 20, 1923.

DR. McCLUNEY RADCLIFFE, Chairman.

Relation of Weakness of Extraocular Muscles to Depth Perception.

DR. WILLIAM F. BONNER, from a study of this interesting subject, had drawn the following deductions

A. In patients with premature presbyopia:

1. Exophoria was combined with good depth perception.
2. Esophoria was combined with poor depth perception.
3. Orthophoria was combined with good depth perception except when associated with high latent hyperopia.

B. In patients with normal near vision:

1a. As a rule exophoria was combined with good depth perception.

b. Two cases had distant vision and depth perception improved by correcting lenses.

2a. Low degrees of exophoria were combined with good depth perception.

b. High degrees of esophoria were combined with poor depth perception.

3. Right hyperphoria was combined with poor depth perception, but hyperphoria and depth perception were improved by correcting lens and prism.

The exception of the relation of exophoria and depth perception with premature presbyopia, was in a patient suffering from pulmonary tuberculosis; in normal near vision, the exception was in a case of epilepsy.

Discussion. DR. PETER said that Dr. Bonner's paper has a broader clinical application than that to which he has applied it, i. e., to the "air service." He recalled the case of a dentist, who was under his care for high myopia, who

found it difficult to properly estimate the depth of a tooth cavity. Altho visual acuity was brought up to nearly normal by means of glasses, his exophoria interfered in his work to such a degree, that he found himself striking the nerve in drilling into the roots in so many instances, and experienced so much difficulty in filling deep root cavities, that he was finally obliged to abandon the practice of his profession.

DR. BONNER stated that he had found the greatest difficulties in the esophorics and hyperphorics. This is exactly what one would expect. In estimating the sense of depth binocularly, accommodation and convergence are the most important factors along with the use of the parallax. In the presence of a disturbed muscle balance, therefore, the artisan who is obliged to do very fine work may find himself very much inconvenienced in acquiring a proper perspective and a sense of proportion.

Tonic Effect of the Sympathetic on the Ocular Blood Vessels.

DR. ADLER said: A paper read before this Society last year cited experiments, which proved the existence of vasoconstrictor fibers to the ocular blood vessels, running to the eye, via the cervical sympathetic.

Since then, a series of experiments were undertaken to determine—

1. Whether the influence of these fibers was tonic in effect, keeping the ocular blood vessels in a semiconstricted state.

2. Whether the influence of these fibers might be protective to the eye, and prevent the intraocular pressure from rising to dangerous heights when the general blood pressure rose.

For a complete description of methods employed and the results obtained, the original article will have to be consulted. A summary of the results follows:

When the blood pressure is raised in an animal the intraocular pressure

is increased. If the rise in blood pressure be slow, the rise in intraocular pressure is in direct proportion to it. When we compare the rise in intraocular pressure before and after section of the cervical sympathetic, with the same rise in blood pressure, we note that after cutting the nerve the intraocular pressure goes up higher. The sympathetic is effective, therefore, in keeping sudden rises in general blood pressure, from exerting their full effects on intraocular pressure. This gives experimental proof to the assumption of Magitot and others, that there is a mechanism in the eye, whereby changes in general blood pressure can be effectually regulated in the eye.

We find no effect on intraocular pressure of cutting the cervical sympathetic with normal blood pressures. By our instrument pressure changes of 0.25 mm. Hg. can be registered, so that if there is any effect on the size of the blood vessels, it is too slight to affect intraocular pressure. On theoretic grounds, however, comparing the innervation of the blood vessels of the eye and ear by the sympathetic, we believe that there is most likely a slight dilation of the ocular blood vessels on cutting the nerve, only much less than there is in the case of the ear.

CONCLUSIONS.

1. When the blood pressure is raised the intraocular pressure is increased. This increase, however, is kept in check by a local vasoconstriction of the ocular blood vessels thru the agency of the cervical sympathetic. This mechanism is a protective one to the eye, and prevents sudden changes in general blood pressure from causing harmful changes in intraocular pressure.

2. This protective action is increasingly effective as the blood pressure ascends. No effect on intraocular pressure is seen when the sympathetic is cut at normal blood pressures.

3. In the normal animal, as the blood pressure is raised, the intraocular pressure rises in direct proportion to it.

Discussion. DR. SCARLET stated that it would be interesting to note several

months later, the ocular tension of animals who had had their cervical sympathetic nerves sectioned, to see if there was any hypotonus present.

In the clinical observation of eleven (11) patients who had received injuries either to the brachial plexus, the cord, or the nerve itself, hypotonus of from one to four degrees was noted in the enophthalmic eye. The reason for this condition was assumed to be the marked miosis, pulling the iris free from the angle.

Case of Birth Injury of Cornea.

DR. EDWARD A. SHUMWAY demonstrated a case of corneal birth injury, due to the application of forceps. The child, now a boy of eight years, was seen four days after delivery. Forceps had been applied because of rigid perineal muscles, the head having remained in a persistent occipito-posterior position. The opacity appeared two days after birth, and the cornea was so opaque, that no view of pupil or iris could be obtained. As the opacity slowly cleared, two oblique lines were found running downward and outward, corresponding to probable tears in Descemet's membrane. Under the use of dionin, the opacity gradually disappeared, leaving a permanent diffuse haze of the cornea, with especial condensation in two oblique lines, situated in the anterior stroma, roughly parallel to two delicate lines on the posterior corneal surface, which corresponded to the position of the tears in Descemet's membrane, originally seen.

The child now had 3 D. of myopia and 3.5 D. of oblique myopic astigmatism, correction of which gave only 5/150 vision. The fellow eye had a plain hyperopia of 2 D. Dr. Shumway reviewed the literature, and said the case belonged in the third variety of the forms described by Thomson and Buchanan in their papers published in England in 1903, 1905 and 1907, in which there is a permanent opacity which takes a linear form, and is due to tears in Descemet's membrane, from pressure of the forceps blade. Very few cases have been reported in America, but more probably would be discovered, if all patients with high astig-

matism in one eye, and defective vision, were examined with this possibility in mind.

Dr. Shumway referred also to *tears in Descemet's* membrane which have been reported in other conditions, such as hydrophthalmos, intraocular tumors, high myopia and keratoconus. In keratoconus however, such ruptures can only be considered as a cause if the keratoconus appears in early youth. The ordinary form which begins at puberty, develops without injury to Descemet's membrane.

Inexpensive Stereoscope for Fusion Training.

DR. SHUMWAY also demonstrated an inexpensive stereoscope for development of fusion training, which he hoped would fill a need, owing to the difficulty of securing a further supply of Kroll's plates, which had proved the most satisfactory, in his experience for home training of convergent cases in young children. The apparatus was called the "Camerascope," and had been brought out for commercial purposes. Special colored pictures were shown, which it was thought would hold the interest of children, one series to secure simultaneous vision, and another for fusion. Stereoscopic photographs of animal groups and other scenes would be provided, and the sets would be in the hands of Wall & Ochs in Philadelphia, either for purchase by the patients, or for the surgeon to lend if he so desired. Completed sets would be shown later.

Corneal Microscope and Slitlamp Studies.

DR. LUTHER C. PETER presented as the first case, one of *remnants of pupillary membrane* on the anterior capsule of the lens, in a girl of nine years of age, who was the victim of *hereditary lues*. Antiluetic treatment was administered four years ago. The Wassermann now is negative. Hutchinson teeth were well marked. The ophthalmoscope revealed fine dustlike deposits on the anterior capsule of the lens. Thru the dilated pupil, the corneal microscope, with slitlamp illumination showed one remnant of pupillary membrane on the nasal side, con-

necting two eminences on the second tier of the iris stroma. The center of the anterior capsule was found to be covered with numerous *star shaped pigmented deposits*, for the most part triangular in shape, but in many instances, with four or five points. From these points there extended fine strands of brownish pigment.

According to Vogt, these remnants of pupillary membrane obtain their pigment from the blood supply. The anterior vascular tunic receives its blood supply, not only from the central artery, but also from the ciliary vessels. P. Toulant (Arch. d'Opht. Paris, May, 1923) found forty-one cases of these deposits in the routine examination of 350 patients, i. e. in eleven per cent of the cases examined. He believes that these pigmented deposits do not represent either embryonal tissue or debris of pupillary membrane, but regards them as cicatrices of iritis and iridocyclitis, and in many instances, stigmata of syphilis.

That eleven per cent of patients examined routinely should show these deposits seems to be an unusual experience. The author, however, is probably correct in a measure as to their etiology. They probably are the result of an inflammatory process upon the anterior vascular tunic. This theory would more readily account for the pigmentation which is found in the remnants of the anterior vascular tunic, and the absence of remnants in the posterior vascular tunic.

Further studies with careful search for the evidence of lues in all forms of persistent pupillary membrane will be of great assistance in the future, in arriving at more definite conclusions as to the exact etiology of these stellate cells. With the ophthalmoscope, these deposits have the appearance of dots, and their exact character cannot be made out, excepting by the use of the corneal microscope and slitlamp.

The second case is one of a *cyst of the posterior surface of the iris*, which in the writer's experience, is almost unique. It occurred in a child of eight years of age, who was seen in consultation to decide whether the posterior polar cataract present, should be needled or left alone.

Thru the undilated pupil, the ophthalmoscope revealed persistent pupillary membrane on the nasal side of the left eye, a posterior polar cataract, and a persistent hyaloid artery which could be followed well back into the vitreous. Thru a dilated pupil, in addition to these observations, a brown pigmented body was found to project from the nasal side of the posterior surface of the iris, forward towards the center of the lens. The slit-lamp examination confirmed and magnified the presence of the pupillary membrane, the posterior polar cataract, which was on the posterior surface of the lens, and a persistent hyaloid artery which floated freely in the vitreous and extended well back into the vitreous body. The pigmented cyst, under a magnification of 24 diameters, was found between the ciliary body, under the posterior surface of the iris, and the lens, which was decidedly flattened and pushed to the temporal side. Projecting from the main body of the cyst, which had considerable depth, were four finger like extensions, which passed back and hugged closely the posterior surface of the lens, extending almost to the posterior polar cataract. The slitlamp penetrated thru the body of the cyst without difficulty, and between the lens and the ciliary body the cyst was of considerable depth, but did not push forward the iris tissue. The iris is grayish blue in color, and the cyst is a rich dark brown.

The patient has not at any time had any inflammatory symptoms, and complains only of inability to see clearly. This eye is highly myopic, and macular vision is impossible thru an undilated pupil because of the posterior polar cataract. The two conditions which suggested themselves to the author were: melanotic sarcoma of the ciliary body, and a pigmented cyst of the posterior surface of the iris. As there have been no inflammatory symptoms at any time, and because of the presence of other congenital phenomena, i. e. persistent hyaloid artery, the diagnosis of cyst of the posterior surface of the iris has been made. No change has taken place in the size of this cyst during the four months of

observation of the patient. No active measures for its removal are contemplated. The case will be kept under observation, and if progressive, the removal of the cyst, with immediate examination as to its character, will be undertaken.

Nodular Iritis of Leprosy.

The third case is one of nodular iritis due to the bacillus of Hansen (leprosy bacillus) which is unusual, first, because leprosy is exceedingly rare here; and second, because according to some authorities, the nodules of leprosy do not appear upon the iris tissue. For the courtesy of reporting this case, the writer is indebted to Dr. Sigmund S. Greenbaum and Dr. Jay F. Schamberg.

The patient is fifty-three years of age, of foreign birth (Jewish), and contracted leprosy of the nodular variety four years ago. The skin surface is literally covered with nodules, and even the mucous surface of the nose and throat has been invaded. The eye complications are recent. There is no invasion of the skin of the lids nor yet of the limbus—the two common seats for eye complication. Altho there is no gross evidence of iritis in the right eye, there are two points of posterior synechia visible with the loupe. There is no pericorneal involvement. In the left eye there is slight pericorneal redness. The cornea is rather hazy, and scattered over the iris surface are numerous plaques, varying in size from a mere pin point to several millimeters in diameter. These plaques are, for the most part, situated between the greater and lesser vascular circles. Tension is good in both eyes.

The slitlamp examination of the right eye shows a few point like deposits on the anterior corneal surface, and a few pigment deposits with isolated muttonfat clumps visible here and there. The corneal tissue, for the most part, is clear. The iris shows two points of posterior synechia, one above, and the other below. The iris for the most part, is healthy, and there is little evidence of atrophy. Minute white spots, pinpoint in size, are visible here and there.

The aqueous is clouded, and the circulation of the nutrient fluids is plainly

visible thru the rather clear media. The circulation is rapid. This relative rapidity indicates a receding process. The slower circulation, when visible, is evidence, as has been pointed out by Von der Heydt and others, of an increasing process and a rather high degree of viscosity of the fluids in the anterior chamber. In the left eye, the cornea is densely infiltrated. The entire surface is fairly well mottled with small, opaque areas, and the stroma is more or less opaque. The most characteristic change, however, is the diffuse Descemetitis, which is peculiar in that it covers the entire endothelial surface from the upper to the lower limbus, and the endothelium is visible thruout, as a gilded mosaic structure.

The iris tissue is atrophic thruout; crypts are almost absent. There is almost complete seclusio pupillae, the pupillary space being also fairly well filled in by dark brown pigment. Scattered thruout the iris tissue are numerous white plaques varying in size from pinpoints barely visible, to areas one-fourth the size of the pupil. Some of these plaques are a dirty yellowish white in color and flattened, and others are elevated, giving the appearance of clumps of snow, and studded with dots of very white intensity. They are, for the most part, found between the greater and lesser vascular circles, altho a few reach to the pupillary space. They differ materially from the tuberculous nodules found in a tuberculous iris. In fact, they do not resemble these nodules in distribution, in size, in formation, or in general appearance.

The Wassermann in this case was first positive and later negative. The von Pirquet test is negative. The leprosy bacillus has been recovered from skin nodules and is demonstrated in microscopic slides, which Dr. Greenbaum will present in his discussion. They resemble very much the tubercule bacillus, altho they can be clearly differentiated. The outstanding facts in the case are: first, the very slight degree of ciliary inflammation; second, the diffuse Descemetitis and the peculiarity of the distribution of

the same third, the leprosy nodules scattered upon the iris. The entire condition is improving under the usual local treatment, and the administration of chaulmoogra oil.

Discussion. Dr. Greenbaum said, since ocular complications are common in leprosy, there is little to add to the case presentation, except that this patient was treated in the G. U. clinic of another hospital for nine months, as a case of syphilis, and because of a 4 plus Wassermann test. With the new Kolmer C. F. T. such a false positive does not occur. She has shown general improvement under injections (intramuscular) of the ethyl-esters of chaulmoogra oil.

Ophthalmic Column for Oculists' Consulting Rooms.

DR. GEORGE S. CRAMPTON exhibited a convenience unit which enables the ophthalmologist to have within his reach most of the equipment necessary for refraction, treatment and minor operations, including means of darkening the consulting room so as to obviate the need of having the patient leave his chair to go to a dark room.

An octagonal cast iron column supports an extension arm, which carries the trial case, which can be moved to any position within a radius of four feet about the column, such as beside the patient for refraction, a meter or so in front for retinoscopy, or entirely out of the way during ophthalmoscopy. During retinoscopy the trial case is illuminated.

At the top of the column there is a bronze receptacle carrying eighteen special dropper bottles and solution holders, as well as receptacles for clean and waste cotton, applicators, wash bottle, etc. A nine inch disc of heavy white glass, in an aluminum frame, forms a cover which can be swung to one side as a support for instruments during an operation.

The bronze treatment compartment rests upon an octagonal expansion of the column, which carries the various controlling switches and other conveniences including three small metal drawers for instruments, an electric steam sterilizer which can be detached

when not in use, and a low voltage rheostat for diagnostic instruments.

There are switches for muscle and room lights and for the visual acuity cabinet, the illumination of which is under rheostat and voltmeter control. A special switch operates a mechanism in the acuity cabinet by means of which any desired line or character may be brought into view.

Standard Illumination Visual Acuity Test Cabinet.

DR. CRAMPTON demonstrated a new visual acuity cabinet, operated by a switch on his ophthalmic column, by means of which any line or character could be brought into view by the movement of a belt of heavy prepared linen three yards in length. The belt was illuminated from the front by

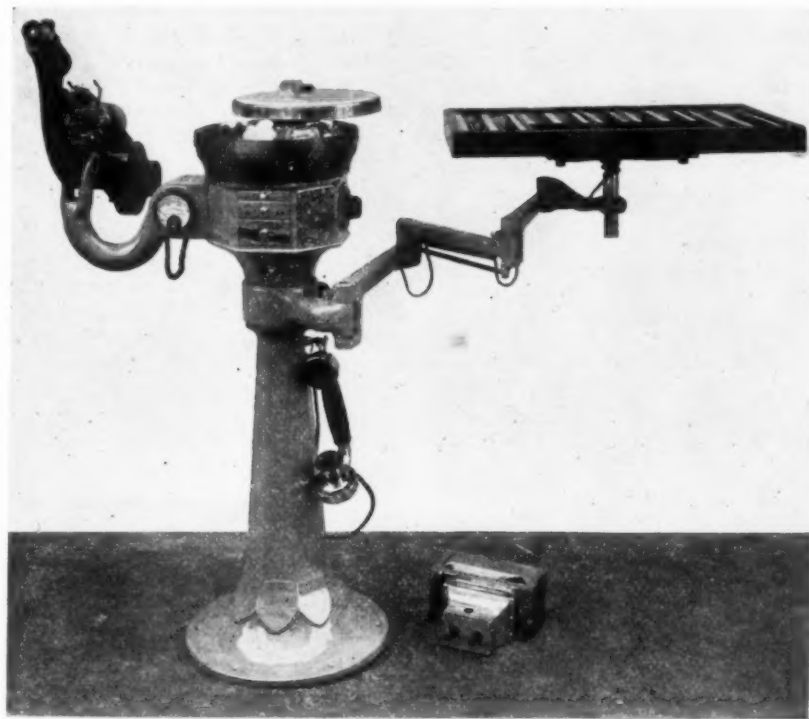


Fig. 1. An ophthalmic column for the consulting room. (Crampton.)

The window shades of the room are automatically controlled by a switch on the column and a motor mechanism at the window, by means of which the shades are raised and lowered to a predetermined height. One movement of the switch darkens the room while a reversal raises the shades.

Another convenient attachment is the onehand telephone which may connect with the secretary's desk in the waiting room, or with central.

The column was shown with a lensometer attached but this is not considered as standard equipment.

means of two long tubular lamps, concealed above and below, and was actuated by a small electric motor which drew it down from a large shade roller and wound it upon another roller below.

The illumination of the belt carrying the test characters was controlled from the ophthalmic column by means of a voltmeter and rheostat. The latter was calibrated by inserting the dial of a foot-candle meter thru a small window cut in the belt near one end.

Automatic Device for Controlling Illumination.

DR. CRAMPTON exhibited an electric

window shade controller, for oculists' consulting rooms, consisting of a motor driven drum mechanism, which actuated a pair of toggle switches when the shade was raised or lowered to a predetermined height, thus preparing for movement in the opposite direction when a switch at the operator's working position was turned. A very small motor operated the drum by means of worm gear, thus supplying ample power for pulling the curtain by means of a cord.

This small unit is placed on or beneath the floor near the one or more window shades to be controlled and, after being set for the height of window or length of pull, is practically fool proof and obviates the necessity of having a separate dark room and moving the patient from his original position for retinoscopy and ophthalmoscopy.

Accommodation Rod.

Dr. Crampton showed an accommodation rod made of hexagonal duralumin, 1 cm. in diameter and a little more than 50 cm. in length. The end of the rod which touches the face or trial lens, as the case may be, was tipped with white celluloid, while the other end carried a ring for hanging. The rod was calibrated in centimeters with a small stud at the thirteen inch point. This equipment was all made by the Lenox Instrument Co. of Philadelphia.

CHARLES E. G. SHANNON,
Clerk.

COLORADO OPHTHALMOLOGICAL SOCIETY.

January 19, 1924.

DR. M. JEAN GALE, Presiding.

Old Penetrating Injury; Organized Tissue.

C. A. RINGLE, Greeley, presented a blacksmith, aged thirty-three years, who in October, 1920, had had a splinter of iron removed with the giant magnet from the ciliary body. The eye had remained quiet, but vision was very slight. From the lower part of the anterior chamber a mass of what looked like organized blood clot extended into the vitreous.

Discussion.—EDWARD JACKSON, Denver, thought that after this length of time we might consider that the eye would remain quiet, and what little vision was retained might be valuable in case of emergency in the other eye. A foreign body might have remained in the eye, but there was no definite evidence of it. A narrow horizontal white streak, possibly of retinitis proliferans, extended horizontally across the fundus, reaching almost to the ora serrata on each side.

W. H. CRISP, Denver, did not feel certain that the horizontal streak might not be a rupture of the choroid.

DR. JACKSON. Some years ago Dr. Aufmwasser showed a case of rupture of the choroid practically horizontal.

Chorioretinitis.

E. R. NEEPER, Colorado Springs, showed a woman, aged fifty three years, who had come on account of failure of vision in the right eye. There was a chorioretinitis. The previous history included pleurisy, osteitis of the forefinger of the left hand, and neuritis of the right arm which was regarded as arising from an infection in the tonsils. The tonsils had been removed and the neuritis had disappeared. There was an impacted wisdom tooth.

Discussion.—D. C. MONAGHAN, Denver. A year or so ago I had a case of ptosis of the upper eyelid in which everything else proved to be negative, but a frontal picture of the skull showed an unerupted tooth. After this was taken out the ptosis disappeared.

EDWARD JACKSON, Denver. This eye gave me the impression that the choroid was red, opaque, and indefinite, and the retina over it decidedly swollen. Almost a quadrant of the visible fundus on the temporal side had old choroidal changes, including pigment changes, and some of the patches had a marked round or oval appearance characteristic of syphilis. But on the whole the condition impressed me as likely due to a focal infection.

G. F. LIBBY, Denver. I saw a case in which no evidence was found of infection around an impacted tooth, but the tooth on removal had necrosis and the culture indicated plenty of infectious material. I believe lues can be

excluded in Dr. Neepers's case, and I would have the tooth taken out.

E. E. McKEOWN, Denver. In the last six months I have seen two cases in which the patient only had light perception, and after removal of an impacted tooth or teeth the vision returned to normal.

W. C. FINNOFF, Denver. In many of these cases of choroiditis in which there are old pigment patches I think we can have a low grade infection which remains in the choroid for months or a year or more after the primary focus of infection has been removed.

Simple Glaucoma.

MELVILLE BLACK, Denver, presented a man, aged fifty-two years, who had glaucoma simplex in each eye. He had come in July, 1918, with the left eye blind and normal vision in the right. He had been under eserine ever since, the pupils remaining at about 1.5 mm., and the vision had not deteriorated in the right eye, nor had the fields altered for the worse, until on December 21, 1923, he had come in with an acute attack of glaucoma in the left eye. A trephining operation had successfully reduced the tension, but it had later been necessary to remove the eye on account of inflammation. The patient still had vision of 20/15 and the field was practically normal. Should anything be done to this eye? The tension had remained about 33 mm.

Discussion.—EDWARD JACKSON, Denver. I should certainly not undertake to operate upon this eye while the vision and field are normal. The tonometric measurement was not infallible, being based upon an estimated curvature of the cornea, and depending to some extent upon the corneal consistency. I should continue to use the miotic and wait.

E. R. NEEPER, Colorado Springs. Most of my cases of glaucoma are of what we used to call a rheumatic diathesis and of a psychic activity above normal. In one woman glaucoma developed after an argument over afternoon tea.

J. A. McCaw, Denver, referred to the importance of considering enlargement of the blind spot in deciding

whether operation was indicated or not. A patient with glaucoma is a sick patient and ought to be under the care of an internist.

F. R. SPENCER, Boulder. I believe this man's apparently complete spirit of cooperation is in favor of waiting.

Dr. BLACK (closing). I feel that if this were my eye I should not be in favor of having it operated upon as long as the field remains good, and also the vision. The patient's physical condition is good and has been gone over carefully. The corneal curvature is about normal with the ophthalmometer, and the tension has never been as high as forty-nine in the eye which is retained.

Retinitis Proliferans.

D. C. MONAGHAN, Denver, presented a man the backgrounds of whose eyes showed a number of striking changes probably resulting from hemorrhage into the vitreous, including an apparent retinitis proliferans.

Discussion.—W. C. FINNOFF, Denver. I believe that recurrent hemorrhage into the vitreous is more common than we usually suppose. The left eye has a characteristic retinitis proliferans, with large pearly patches off to the nasal side. In severe cases this disease is commonly a bilateral affair, but is overlooked in the second eye because one needs a widely dilated pupil and one must study the extreme periphery to find signs of activity. I believe that the cases in which we find perivascular exudates before the hemorrhages occur are tuberculous. In these cases the greatest amount of scar tissue is found at the periphery, altho it is commonly stated that retinitis proliferans begins near the disc.

EDWARD JACKSON, Denver. There may possibly be an endocrine disturbance in this case.

Degenerative Changes Following Injury.

W. C. BANE, Denver, presented a boy, aged thirteen years, who in 1920 had received an injury to the right eye from a piece of weed, which had caused a punctured wound in the sclera not far from the cornea. He had recently received another blow on this eye, and had been suffering from an acute in-

flammation. The vision was blurred, the pupil irregular and partially dilated, the anterior chamber shallow, the lens cataractous. Transillumination was not good, and was worse from below than in other directions. The eyeball was congested but not painful.

Discussion.—F. R. SPENCER, Boulder. There may be a foreign body in the eye, and X-ray should be resorted to in the hope of demonstrating this.

Small Detachment of the Retina.

W. C. BANE, Denver, presented a man, aged sixty-six years, who had come complaining of impairment of the nasal field of vision of the left eye, without pain. Examination had revealed detachment of the retina in the upper temporal quadrant, and for twenty degrees into the upper nasal quadrant, and the detachment also involved the upper two-fifths of the lower temporal quadrant. The vision has rapidly fallen from 5/12 to 5/30. There was no history of injury, and no appearance of a tumor.

Discussion.—MELVILLE BLACK, Denver, suggested the possibility that the detachment was due to a flat tumor. There was no fluttering of the retina.

Primary Optic Atrophy.

E. B. SWERDFEGER, Denver, presented a man, aged fifty-four years, whose vision had been failing for the past two years, and was now R. 5/300, L. 5/600. The fundi were negative with the exception that there was a pronounced atrophy of each optic nerve head. The patient had been a heavy drinker and smoker. There was an Argyll Robertson pupil, and the patellar reflexes were absent, the Romberg positive. A blood Wassermann had proved negative, both before and after provocative treatment. A spinal Wassermann was to be made later.

WM. H. CRISP,
Secretary.

ST LOUIS OPHTHALMIC SOCIETY

Meeting of January 25, 1924.

DR. W. A. SHOEMAKER, President.

Episcleritis.

DR. J. F. SHOEMAKER reported two cases of episcleritis, apparently caused

by the excessive use of carbohydrate foods. One case, a woman, 30 years of age, had suffered two months with sclerokeratitis which did not improve with the ordinary treatment. Inquiry concerning her diet revealed the fact that she was living largely on white bread and pastry. Upon withdrawing these and other starchy foods, she began to improve at once and had entirely recovered in a few weeks time.

The other case, a man 52 years of age, had been under treatment for three months with little or no improvement. He was eating very freely of pastries and sweetmeats. All pastry, sugar, and potatoes were stopped and only a small amount of white bread allowed. With these things eliminated from his diet, he improved steadily and the episcleritis disappeared entirely in about a month. On account of losing weight his physician advised him to eat potatoes and more bread; which he did, and with them began eating pastries again. Very promptly he developed a sclerokeratitis in the other eye, which did not yield to treatment until starches and sugars had been eliminated again, when improvement began and the eye promptly recovered.

Reference was made to the article by Drs. Sinsky, Levin and Sachs published in the November, 1921 number of the Archives of Ophthalmology, where they report their findings in a case of chronic episcleritis; in which they made metabolic studies and, by experimenting with different kinds of food, proved to their own satisfaction a causal relationship between the diet and the eye lesion. They found that with a diet rich in carbohydrates or fat the symptoms always became worse, while with one poor in these and rich in protein the symptoms improved; and the inflammation soon disappeared entirely when the patient kept to the latter kind of diet.

DR. SHOEMAKER is inclined to agree with the conclusion of these writers that the ocular condition in these cases is caused by poisons formed in the intestinal tract, due to the faulty digestion and metabolism of the carbohydrates and fats.

Discussion. DR. JOHN GREEN, JR., stated that several years ago Conlon

described several cases of conjunctivitis which he believed were provoked by food proteins. In one patient the eye would flare up on eating strawberries or tomatoes. A second patient had a sandy sensation in his eyes, with sudden lacrimation, which promptly disappeared with the withdrawal of eggs from his diet; the protein test for eggs was positive. A third patient showed lid inflammation after eating flounders. We are all familiar with the prompt improvement in many (not all) patients suffering from phlyctenular keratitis, on withdrawal of carbohydrates and the thorough cleaning out of the intestinal tract with mercurials and salines. Dr. Shoemaker's suggestion is worthy of careful consideration not only in episcleritis but in many other surface inflammations.

DR. EDWARD H. HIGBEE was of the opinion that some portions of the eye show a definite affinity for focal infections, while other portions reflect conditions more of the toxic noninfectious type of disturbance. Dr. Shoemaker's experience rather strengthens this idea, in that from an intestinal toxemia the patient developed an episcleritis. We do find phlyctens, corneal ulcers and diseases of the superficial layers of the eyeball in cases where there is a malnutrition or intestinal disturbance; while in deep scleritis, iritis, cyclitis, choroiditis, etc., we often find the typical focal infections arising from tonsils, teeth, prostate, etc.

Perimetry.

DR. W. E. SHAHAN read a paper on the subject, in which he delineated the advantages and disadvantages of present modes of mapping fields. The perimeter of Förster and all its modifications up to its highest development, the Feree-Rand instrument, are monocular instruments. The value of binocular fixation is lost, and the instruments are not well adapted for mapping central or paracentral scotomata. They also fail to reach the full periphery of the field.

The tangent plane and all its modifications, including stereocampimeters, reach only a limited portion of the field. The stereocampimeters make use of binocular fixation and are

valuable instruments for mapping central or paracentral scotomata.

The great confusion in notation in indicating meridians was remarked, and an emphatic plea made for trigonometric notation, beginning with zero on the right and going all the way round the circle. This method is exact, has long been firmly established in all branches of mathematic and engineering science, in all parts of the world, and there is no reasonable excuse for ophthalmologists introducing strange and confusing methods.

The opinion was expressed that if we are to make use of binocular fixation, accurate measurements throughout the entire field, uniform illumination and standardized color tests in terms of wave lengths of light, an entirely new principle would have to be introduced into perimetry.

There are several ways of attacking this problem and work is now being carried on on some of these. The paper was discussed by Drs. Green, Woodruff, Tooker, Post and Shahan.

J. F. HARDESTY,
Secretary.

BALTIMORE CITY MEDICAL SOCIETY.

Ophthalmological Section

Meeting of Feb. 28, 1924.

DR. J. W. DOWNEY, Presiding.

Teeth as Etiologic Factors of Eye Lesions.

Ocular Lesions of Dental Origin.

DR. ALAN WOODS would divide the evidence into two classes, clinical and experimental. The clinical cases are easily divided into two classes. The irritative present asthenopic or neuralgic symptoms, and are frequently caused by unerupted teeth or apical abscesses, and can be explained through reflex irritation of the trigeminal nerves. The infectious conditions may involve any part of the uveal tract, or show a retrobulbar neuritis or a keratitis. The evidence to substantiate this connection is either clinical or experimental. Under the head of clinical the greatest point of evidence is shown in the fact that after the removal of the infected teeth, the ocular lesion improves, in some cases very rapidly.

In other cases, however, there seems to be an exacerbation of the symptoms following sudden removal of the teeth.

The experimental evidence is shown in "Stack's Work" in which he produced eye lesions by intravenous injections of organisms, and also by the injection of organisms directly into the ocular vessels.

Rosenow's experiments lead him to believe in the selective action by some of these organisms. Hayden has shown that individuals having apical abscesses were much more frequently subject to eye lesions. If one eliminates the oral sepsis, the eye may improve very rapidly, or may show an increased inflammation, or may remain stationary. This makes the clinical evidence less conclusive.

The experimental evidence is also open to question, as the metastatic infection should show same organisms that are present in the apical abscess, but so far this has not been proven. Toxins as a rule do not produce eye lesions. The allergic theory is the one most recently advanced. This explains the condition but here again evidence is lacking. From a practical standpoint a middle ground should be taken. In the past, too many teeth have been sacrificed.

Role of Infected Teeth As Seen by the Internist.

DR. W. T. LONGCOPE (by invitation) thought from the clinical evidence there is undoubtedly a relationship between focal infections and distant lesions. Whether the condition is a result of metastasis of the organisms or their products, or whether it is an allergic phenomenon he was unable to state. We do know, however, that organisms may be found in the circulation where localized abscesses exist. The removal of the infected teeth may be followed by the presence of organisms in the blood, and endocarditis may result. Focal infections certainly produce some injury to the host, for when these infections are removed the patient usually gains in weight with increased hemoglobin and generally improved feelings.

About the question of allergic phenomena resulting from bacteria little is known. Apparently there are two

substances that can be isolated from bacteria, one proteid in character and the other nonproteid and highly soluble; the latter may produce a very positive shock when the animal is sensitized to the first.

Points of focal infection must always be sought and removed, if found, even if one is not able to advise the patient that the specific complaint is caused by such infection.

Focal Infection from Teeth as Interpreted by X-Ray.

J. HOPKINS, D. D. S., Belair, Md., spoke by invitation. Infections may come from without or from within the teeth. Radiographs should be taken of all suspicious teeth. He showed lantern slides demonstrating various types of dental infection.

Clinical Handling of Teeth Showing Infection.

H. M. DAVIS, D. D. S., by invitation, showed X-rays of many cases of bone cysts and osteomyelitis of the jaw, as results of infection, or misplaced teeth. He cited many clinical cases of eye lesions associated with infected teeth. He thinks that unerupted teeth produce the most disturbance.

Discussion. DR. HIRAM WOODS reported two cases of acute choroiditis associated with infected teeth, two cases of episcleritis, and one of relapsing iritis due to infected teeth.

DR. JAMES BORDLEY reported a case of phlyctenular disturbance of many years duration, which cleared up after removal of an infected tooth. There was a decided relapse at the end of a year, and no point of infection about the teeth could be discovered. He also reported a case of iritis of three months duration, which was relieved after removal of tooth with an apical abscess.

C. A. CLAPP,
Secretary.

NASHVILLE ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

January 21, 1924.

E. B. CAYCE, M. D., Chairman.

Bilateral Anterior Polar Cataract.

DR. HERSCHEL EZELL reported the following case: E. W., aged 19, male,

black, who came to the Eye Department of the Nashville City Hospital September 10, 1923 complaining of impaired vision.

History. Family history negative. Both parents were living and well and not related. Four sisters living and well. No other member of the family had eye trouble. The patient had had most of the diseases of childhood; was well developed and strong. The eye condition dated from birth. He stated that he could see better in a

OREGON ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

February 18, 1924.

FRED A. KIEHLE, Presiding.

The annual meeting of the Oregon Academy of Ophthalmology and Otolaryngology was held at the Chamber of Commerce, Portland, Oregon, following dinner, at which twenty-eight members of the Academy were present. Minutes of previous meeting

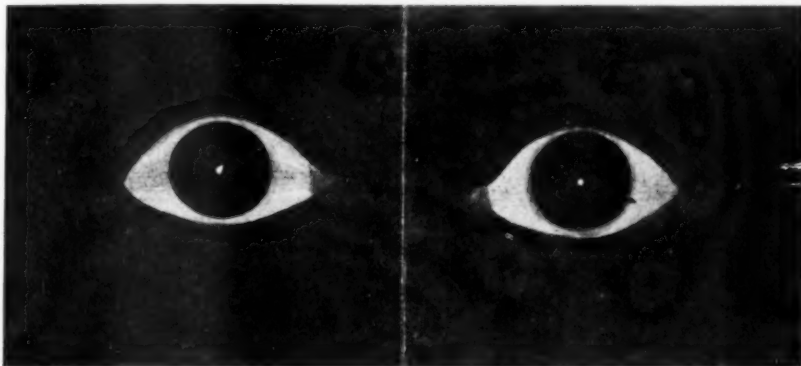


Fig. 1. Anterior polar cataract. (Ezell's case.)

subdued light, e.g. on cloudy days and at dawn, than in a bright light. He was unable to read by artificial light.

Examination. Each eye V.=20/40 tested by regulation test type. Each eye was +1.50 D. hypermetropic. There was slight nystagmus present. Each eye showed lids and conjunctiva normal, pupils equal and responded to light and accommodation, cornea and iris normal, anterior chamber normal. In the center of each pupil there was a small opacity, a little more pronounced in the right, with a small process extending backward, cone shaped. Fundus of each eye normal. The accompanying picture (Fig. 1) shows the size and form of the cataracts quite well. There was no history of ophthalmia neonatorum.

Dr. Ezell regarded this case of special interest because of the small number of such cases which are reported.

DR. HILLIARD WOOD,
Editor.

read and approved. Report of Secretary-Treasurer for the past year read, and ordered placed on file.

Nominations and elections resulting in the election of Dr. George Ainslie, as president; Dr. L. O. Clement, 1st vice-president; Dr. H. M. Hendershott, 2nd vice-president, and Dr. A. J. Browning, secretary-treasurer.

Dr. Kiehle made some observations on his recent trip in Europe.

Cavernous Hemangioma of Orbit.

DR. CLINTON T. COOKE reported this case. Patient was a well developed woman, aged 53 years. Complained of a gradual change in the appearance of the left eye. Slight drooping of upper lid. Recently a slight proptosis and enlarging of the lower lid has developed. History negative, otherwise. Family history, negative as to tumors.

Examination showed O. D. negative. O. S. conjunctiva and eyelids, cornea, iris, anterior chamber, lacrimal apparatus negative, except that the anterior portion of the lacrimal gland protrudes decidedly on slight pressure at the outer canthus. Fundus nega-

tive, vessels not tortuous or distended; of normal color. Perforating vessels not injected. Tension 25 mm. Hg. Both corneas sensitive to cotton fiber. Pupils equal, $3\frac{1}{2}$ mm. Direct and consensual reactions normal. React to convergence. L. proptosed 2 mm. by exophthalmometer. Exophoria 3 degrees at 6 meters; 1 degree at 30 c.m. Left hyperphoria 1 degree.

The anterior margin of a smooth, rounded, nonpulsating mass, which displaces the eye up, forward and nasally, can be felt deep in the lower cul-de-sac near the outer canthus. There is no tenderness and no bruit. Proptosis did not apparently lessen on steady deep pressure, or on change of posture. No nasal discharge. Artificial dentures. Skiagram of sinuses, especially antrum, negative. Urine negative, as was also the Wassermann and the general physical examination.

Blood examination: reds 4,500,000; leucocytes 7,000, polys, 75%; large monos, 25%.

Tentative diagnosis, retrobulbar tumor. Advised operative removal because of steady increase in size, accelerating of late.

A Krönlein resection of the orbital wall showed a dark colored, encapsulated, nonpedunculated tumor, 23x26x28 mm. in size. This was removed. There was no bleeding of consequence. Twisted catgut drain. Continuous catgut suture of periosteum. Silk-worm gut skin sutures.

Except for the usual chemosis and edema of the eyelids the healing was uneventful and the result ideal. Vision 6/5 O. S. and orthophoria.

Microscopic examination showed the tumor to be cavernous hemangioma. Lantern slides of the growth were shown.

DR. ANDREW J. BROWNING,
Secretary-Treasurer.

ROYAL SOCIETY OF MEDICINE, LONDON.

Section of Ophthalmology.

February 8, 1924.

MR. A. L. WHITEHEAD (Leeds),
Sectional President.

Tuberculosis of Optic Nervehead.

MR. A. D. GRIFFITH showed a case of tuberculosis arising in the optic

nervehead, in a man. When he first saw the patient there was no vitreous effusion, and the mass was obviously arising from the nasal half of the optic disc and the immediately surrounding retina. Since that date, the growth had passed nasally forwards into the vitreous, leaving a patch of apparently normal retina between the mass and the nerve. The man had suffered from pulmonary tuberculosis. The Wassermann was negative.

Discussion. MR. RAYNER D. BATTEN referred to an apparently similar case which had been under his care; that also was a mass on the nasal side of the disc. This woman had a large vitreous hemorrhage at first, and the vitreous did not become clear until a year later. When it did clear, she had developed a mass on the nasal side of the disc, first in a ringed shape, like retinitis circinata. He pointed out that in the case now shown there were many vitreous opacities. In his own case the cause was not known.

Luxation of Eyeball at Birth.

MR. GRIFFITH also showed an infant who was brought to hospital four hours after birth. It was a forceps delivery for placenta previa. The right eye was luxated forwards out of the orbit, the conjunctiva was torn round the limbus, the internal rectus was ruptured, and subsequently ulceration of the cornea occurred, tho the latter subsequently healed up. Now, the eye could be adducted a little, and there seemed to be a weak attachment to the globe. The optic nerve was evidently ruptured.

Ethmoidal Mucocele.

MISS ROSA FORD showed a woman with what was regarded as ethmoidal mucocele. The complaint was that the eyes were painful and were watering; she also had occasional momentary diplopia, and there was a chronic discharge from the left side of the nose. While she had scarlet fever, at 6 years of age, a lacrimal abscess was opened on the right side, and chronic discharge from the left nostril dated from then. At the present time a cystic swelling could be seen in the left orbit, extending above and below the internal tarsal ligament, and back to the inner wall. The eye was displaced slightly

upwards and forwards, and on extreme movement in any direction diplopia was experienced. There were no fundus changes, and vision in the left eye was 5/9. Mr. Gay French regarded it as an ethmoidal mucocele.

Discussion. MR. J. GRAY CLEGG thought this should be attacked from the inside.

MR. T. HARRISON BUTLER thought this might turn out to be a frontal mucocele, and that such cases should be handed over to the rhinologist to deal with. This was the more necessary as the surgeon might be faced with the need of doing a complete Killian operation. Unless quite familiar with the technic, there might result a depressed scar, or diffuse osteomyelitis.

MR. R. AFFLECK GREEVES thought this was more likely to be a frontal than an ethmoidal mucocele; the ethmoidal cases he had seen pointed lower down.

MR. R. LINDSAY REA pointed out that such a case might be brought to the ophthalmologist for an opinion, and he could not straightway hand it over to a rhinologist. The kind of tube used to get a skiagram of these cases was usually too soft; one was required giving a 12 in. spark-gap.

THE PRESIDENT regarded this as a fronto-ethmoidal mucocele. He had had some experience in nasal work, and to him this was fairly obvious. It should be attacked from the inside, from the nasal side. Clearly it was a case for the rhinologist, and there need be no scarring.

Modified Extraction of Senile Cataract.

MR. BASIL LANG referred to a case he was told of in which a tumor was seen in one eye, lying over the ciliary body, and this tumor was regarded as malignant. No lens could be seen behind the pupil. The eye was excised, and section showed it to be the lens; it had apparently been forced into that position when an attempted extraction was done. He remarked that the lens did not always begin to come forward on the first pressure of the cornea below. Tho he had watched many operators, he had rarely seen the lens extruded without some coaxing, or aided by the cystitome.

The first effect of placing the curette on the lower part of the cornea was to decrease the intraocular volume. He explained in detail what he considered happened, from the point of view of mechanics, at each stage in the operation.

He thought it would be distinctly advantageous if the hole thru which the lens was to be delivered could be made as deep as possible in the antero-posterior diameter. This was his modification of the customary technic. Having completed a large section, he lacerated the capsule with the cystitome. With the patient looking down, he pressed the scoop flat on the sclera at the 12 o'clock position, with its edge in contact with the wound, and he pressed it backwards towards the center of the globe. The wound began to gape, and the vitreous forced the lens forwards against the under surface of the cornea. Further pressure increased this gaping, and the lens began to force the iris in front of it out of the wound. On further pressure the lens edge was seen to stretch the iris until it came close up to the pupillary border; and now for the first time Mr. Lang applied pressure below with the curette against the cornea.

The iris was never subjected to pressure between the sclera and the lens, and apparently had not lost its tone, and the slightest touch with the repositor, or the stream from the irrigator, caused it to return within the eye, and the pupil to assume a central position. His modification, he submitted, rendered the operation both simple and safe. At Moorfields, before he adopted this modification, he had 5 prolapses in 43 straightforward simple extractions. He had given up using eserine drops. In the last 31 cases at the same hospital, he had had only 2 prolapses, one of which should not be brought into the series, as the iris of that eye was atrophic. By avoiding damage to the iris, iritis did not follow the instillation of eserine. The iris did not lie flaccid and toneless in contact with the wound; rather it was taut, thus allowing any escaping aqueous to run over its surface.

Modification for Needling Capsule After Cataract Extraction.

MR. LANG said that after the lens had been removed and the eye was quiet, it was desirable to make a hole in the lens capsule; otherwise at a remote date the visual acuity would begin to be reduced. At that date the capsule would have lost its elasticity, and the operation would be difficult, as the incision would not gape, and any flap cut would fall back into its original place and continue to occlude the pupillary area. The needling was intended for its remote, rather than its immediate benefit.

In former days eyes were lost from one of two reasons: Sepsis, or glaucoma due to the angle becoming blocked by vitreous, or by exudate from a chronic cyclitis, or from both causes. The sepsis resulted from the operation tract becoming infected with organisms from the conjunctival sac, and it could probably only occur if the needle was made to enter the anterior chamber by passing it directly thru the cornea. To avoid this, the needle should be passed subconjunctivally into the anterior chamber. To make more sure, the surface of the conjunctiva could be painted at the point of entry of the needle with a 1 per cent solution of silver nitrat.

Whenever vitreous got into the anterior chamber, glaucoma was likely to occur. This was why dislocation of the lens occasionally ended so disastrously in glaucoma; for this reason he did not advise patients to have the lens removed in its capsule, as that left the vitreous unsupported. He was careful to procure a needle of suitable proportions; if the shaft of the needle was of the correct diameter, it just filled the hole and prevented escape of aqueous. If the shaft diameter were 1, the width of the blade should be $1\frac{1}{2}$. His habit was to use a Bowman's stop needle; not a Ziegler's knife. Moreover, it was rarer to find the latter with a shaft the correct size. The sooner the operation was done, the easier it was.

He never divided the capsule if there was any quantity of unabsorbed lens matter. In the latter event, when the

eye was white, he passed the needle into the anterior chamber, rotating the shaft thru 90° , moving the blade paddle-fashion, to stir up any lens matter. He then had the eye hot bathed, and in a few days the lens matter had been absorbed. He described his procedure with a wealth of detail. He had the room darkened and good focal illumination, to enable one to see the gossamer like posterior capsule. With a needle of the correct proportions none of the aqueous would escape from the anterior chamber, and the capsule could be cut three or four times if necessary.

He summed up the advantages of this modification as follows: It was easy; it avoided the possibility of sepsis; it obviated the possibility of glaucoma, and it eliminated the necessity of stirring up the vitreous.

Discussion. DR. W. H. BRAILEY (Brighton) said he agreed that in doing the extraction it was important to get rid of the sclerotic behind the lens. By not putting on pressure below, one lost the mechanical advantage of tilting the lens forward. He thought the worst cases of glaucoma were those due to the ingrowing of corneal epithelium thru the wound.

SIR RICHARD R. CRUISE said it was most important, in doing cataract extraction, to produce a tilting forward of the lens. His practice was to do a simple extraction; and he invariably fully dilated the pupil. He lacerated the upper part of the capsule first with a cystitome, meeting that with a T-shaped incision coming from below upwards. The lens had then begun to present in the forward position. He then produced pressure on the posterior lip of the wound thru the eyelid—he did not use an instrument for this. With a tortoise shell spoon he coaxed the lens out. The iris should be contracted into as rigid a mass as possible, so that fluid could escape round the border of it, rather than pushing a fold in front of it. In the last four years he had had two cases with a slight adhesion of the anterior surface of the iris to the wound, and in each of those he made a small incision with a Ziegler

knife in the lower part and pulled it off with a repositor.

MR. J. GRAY CLEGG expressed his reluctance to do dissection in the early stages. Most of his cases returned with excellent acuity of vision without resorting to this.

MR. T. HARRISON BUTLER remarked that much had been said about pressure, and said that in doing cataract extraction the first thing to avoid was pressure. The operation should be so planned that the lens came out with a mere touch. The objection to the simple operation was that it demanded more pressure than did one in which iridectomy was done. He did not think there was a better lens expressor than the Heidelberg. He preferred the Ziegler knife, but it could only be resharpened once if it was to retain its efficiency. Professor Ziegler was always most careful to have his knife so made that the shaft not only fitted the opening made by the blade, but was exactly parallel, so that in making cutting movement it could be slid backwards and forwards thru the cornea without moving the cornea. One could examine the capsule carefully and make the incision in such wise that the gap could be made where it was wanted. He aimed to get as large an opening as he could, but why needle? When sepsis followed, he felt sure in some cases it came from the inside, that it was blood-borne. He did know why further risks should be taken when vision was 6/9 or 6/12.

MR. H. KIRKPATRICK referred to the operation now carried out in Madras.

THE PRESIDENT said, after some experience he had now reverted to the combined operation, and with it he was satisfied. He agreed that if patients had 6/6 or 6/9 vision, they might be left without needling. He did not advise needling within a few weeks of cataract extraction.

MR. BASIL LANG, in his reply, dealt with the mechanics of the procedure, and said his object was to do the least possible damage to the iris. He knew of only one case in which epithelium grew over the inner surface of the cornea. He thought the dirty eyelid ought to be kept out of the clean

wound. In his last 32 extractions he had only one prolapse, and that was due to the patient being specially sensitive to the aspirin given, and she vomited violently. He had certainly seen cases which would have been better had they been needled. If a capsule were allowed to get into the wound, nothing would save the eye. In regard to the alleged needling failures, he would want to know how long they were made for, in what medium, how the swab was taken, and who made the cultures.

Classification of Diseases of the Choroid.

MR. MALCOLM L. HEPBURN said the nomenclature in relation to diseases of the choroid had always, in his view, been unsatisfactory; and there seemed to be no settled opinion as to the etiology and course of the disease processes attacking the choroid. Fundus diseases ought to be classified according to the structure in which they occurred. The results of classification by position alone were that the terms retinochoroiditis, myopic choroiditis, choroidal atrophy, degenerations, holes, etc., were applied indiscriminately to all sorts of diseases, regardless of their pathologic meaning, or whether they originated in the choroid or the retina. In this paper he dealt with choroid only. All such conditions were associated with pigmentary disturbances, but in solely retinal affections no such changes occurred. The American Encyclopedia of Ophthalmology contained 26 forms of choroidal inflammation which seemed to require separate headings.

The classification he now put forward fell into five groups: 1. Inflammatory; 2. Vascular; 3. Degenerative; 4. Congenital; 5. New Growths. The need for discriminating between the first two groups was, that in the recent stage the treatment was quite different. At present the term retinochoroiditis was used to describe both acute and scarred forms, whereas it really implied an acute inflammation.

The clinical features associated with inflammatory diseases of the choroid were vitreous opacities, and sometimes

keratitic deposits in the acute stage, with scotomata in the usual field, of different shapes and extent, and which remained permanent in the scarred stage. The acuity of vision was suddenly reduced to considerably below normal, but might recover completely when the inflammatory exudate had become absorbed, unless the macula happened to be the part involved.

He contrasted this with a typical case of choroidal affection due to vascular changes—primary, pigmentary degeneration of the retina. In the latter there was the typical "bone corpuscle" arrangement of pigment in the midperipheral region, scattered over an otherwise normal looking fundus, and the cause had been acknowledged to be the altered condition of the choriocapillaris. Cases were met with in which the bone corpuscle shaped pigment was scattered over a fundus which was not normal, and where evident changes in the choroid had taken place previously, resulting in the larger vessels becoming affected.

In this way the choroidal blood supply was cut off, and the same effect was produced on the retina as in primary pigmentary degeneration. These were cases of pigmentary degeneration secondary to disease of the choroid. A hemorrhage from the choroidal blood vessels would sometimes be so extensive as to wash out the pigment mechanically from the pigment epithelial layer, when it was seen indistinctly mixed up with the blood. When the latter became absorbed, these small masses of pigment were left high and dry, giving a granular appearance to the disturbed area, but there was no proliferation.

In degenerations such as the typical Tay's choroiditis, the pigment was merely pushed aside by the hyalin masses; no proliferation of pigment could be seen, only small white or yellowish white patches, with an even pigmented border. Tay's choroiditis was now known to be a hyalin degeneration of the membrane of Bruch.

From the considerations set out in the paper, the author thought the following conclusions could be drawn:

1. Where there was an edematous patch accompanied by a sudden lower-

ing of the visual acuity, vitreous opacities and keratitic precipitates, followed by the formation of fibrous tissue of varying amount, with many coarse masses of pigmentation, the causal condition was of inflammatory origin.

2. Where the pigmentary changes were of a fine granular type, and the choroidal disturbance was of a somewhat indefinite character, accompanied by a varied and gradual reduction of vision with no vitreous opacities and no keratitic precipitates, it was of vascular origin.

3. Where white or whitish-yellow areas were found, surrounded by an even, well defined border of pigment, not excessive in quantity, with no choroidal disturbance round it, it was a hyalin degeneration, probably of the membrane of Bruch.

4. When there was a pearly white patch, with no vessels crossing the floor of it, and a narrow fringe of pigment round a well defined margin, and with no choroidal disturbance beyond the actual defect, probably it was of congenital origin.

He said the characteristic features of a new growth were the raised choroidal swellings often with a well defined, nonedematous border, and any pigment present was indefinitely mixed up with the main mass. Frequently there was an ordinary detachment, a separation between the neuro-epithelial layer and the pigment epithelial layer, somewhere in the neighborhood of the growth. The diagnosis was helped by the presence of new vessels.

He showed, by the epidiascope, drawings illustrative of the points he was seeking to establish. Dr. Batten, he said, had attempted to associate many diseases of the macula with affections of the brain, causing various mental disorders, and that gentleman associated the two together as a disease of the nervous system, analagous to amaurotic family idiocy. That Mr. Hepburn looked upon as a stretching of the analogy too far.

Discussion. MR. RAYNER BATTEN claimed a special place in classifications for diseases of the macula, as that region was singled out from the rest of the fundus anatomically, physi-

ologically and clinically. True, it contained both choroid and retina, and therefore was liable to be involved in diseases affecting either of those structures. The macula itself was avascular, and was surrounded by a network of terminal vessels. It was liable to special involvement in some diseases and practical exemption in others. In

the latter were syphilis and tubercle. In glaucoma, this area might survive to the end, yet in myopia it seemed to be singled out for destruction. Macular disease was so markedly symmetric, that if symmetry was absent in a case, he felt doubts as to whether it should be classed as a macular case.

H. DICKINSON

SPECIAL REPORT.

TOXIC EFFECTS OF LOCAL ANESTHETICS.

EMIL MAYER, M.D., CHAIRMAN.

This is the portion bearing on ophthalmology, of the report of a committee appointed by the Board of Trustees of the American Medical Association, at the request of the Therapeutic Research Committee of the Council on Pharmacy and Chemistry. The committee making the report was composed of members representing various special branches of medicine and surgery as follows: Elliott C. Cutler, Boston, Surgery; David I. Macht, Baltimore, Medicine; Alexander Randall, Philadelphia, Urology; Henry S. Dunning, New York, Stomatology; Robert A. Hatcher, New York, Pharmacology; Emil Mayer, New York, Laryngology; Charles Norris, New York, Pathology; Robert S. Lamb, Washington, Ophthalmology. The complete report is published in the *Journal of the A. M. A.*, March 15, 1924, v. 82, p. 876.

The work of the committee included the investigation of the following: "1. A study of the records of all fatalities reported. 2. The tabulation of symptoms in fatal accidents. 3. The determination of the relative danger with various methods of application. 4. The determination of the relative sensitiveness with reference to different parts of the body. 5. The determination of the special value of the several local anesthetics in special fields of medicine. 6. The determination of the relative value of solutions of different concentration. 7. The determination whether epileptics are especially sensitive. 8. The formulation of rules to prevent avoidable accidents."

The questionnaire included this: "1. Have you during 1919, 1920 and 1921 noted any toxic effects, fatal or not, following the use of local anesthetic? Yes, No. 2. If so, please submit a case report of each instance. Record, among other facts, data regarding the patient's general condition, the occasion for using the local anesthetic, the drug employed, position of the patient, and the dose administered." Of the foregoing, 4393 copies were sent out; and replies were received from 1836. Where report of toxic effects was received, this was followed up by further inquiries.

In this way were obtained accounts of 43 deaths following the use of local anesthetics, of which at least two were believed to be due to other causes. "The chairman received apparently trustworthy information of several deaths in addition to those tabulated in this report, following the use of local anesthetics, after which he wrote to those who were alleged to have administered the anesthetics. In a few instances he received no reply to his letters; in some others the occurrence of the accident was denied."

"In all those instances in which death was surely due to the local anesthetic, the toxic symptoms were practically the same. In these cases death occurred very quickly, usually before any operation could be performed. The effects in man are strikingly similar to those induced experimentally in animals, as were those reported by the committee of the Section on Laryngology, Otology and Rhinology. Convulsions and failure of respiration were usually observed within a few minutes after the administration of the local anesthetic.

The fact that alypin and stovain each caused only one of these deaths does not indicate that they are of low toxicity, and the relative infrequency with which they are used, should be

borne in mind. Two members of the committee report that apothecin caused most frequent complaint among those who reported to them, especially because of sloughing that followed its use.

The five deaths reported after the use of butyn, alone or in combination with cocain, indicate the necessity of caution in its use. Two of these deaths followed within a few minutes after the application of a 5 per cent solution of butyn to the nose. Its use is still in the experimental stage.

Cocain, alone or in combination with epinephrin, caused the greater number of deaths in this series. It was used in solution in concentrations varying from 0.5 to 20 per cent, and in the form of a paste, and with epinephrin. It abolishes reflexes and induces satisfactory local anesthesia when applied to mucous membranes. The committee concluded that this can be accomplished without danger by the use of carefully measured amounts of solutions of low concentration, which should be applied only locally to the field of operation.

Procain (novocain) is used far more frequently than any other local anesthetic, but it caused only one (possibly two) of the fatalities. This statement must not under any circumstances be taken to justify the careless use of procain, for it is certainly capable of causing sudden death when used without proper care.

It became evident to the members of the committee that procain did not contribute materially to the cause of death in several of the cases in which it was used with cocain. Patient 63 received a concentrated solution of cocain with epinephrin, and less than half a grain of procain; and Patient 67 received not more than one-sixth grain. It would be obviously misleading to report these two deaths as due to cocain and procain without explanation. It seems probable from what we know of the synergistic actions of cocain and epinephrin, that procain contributed little to the cause of death in any of those cases in which it was used with cocain and epinephrin. The syner-

gistic actions of cocain and epinephrin will be discussed later.

Of the forty deaths possibly due to local anesthetics mainly, twenty-four were of males and sixteen were of females; the youngest patient was 3 years old, and the eldest, 70. Twenty deaths occurred in hospitals; ten in physicians' offices; six in dispensaries, and in six cases the place is not reported. Fifteen patients were lying down, twenty-one were sitting, and in the remainder the position is not stated.

LOCAL ANESTHETICS THAT CAUSED DEATH.

Alypin	1
Apothesin	4
Butyn	4
Butyn and cocain.....	1
Cocain (alone and with procain)...	25
Procain	1
Stovain	2
Not classified	2

40

NONFATAL ACCIDENTS.

Many reports of toxic, but not fatal, accidents were received by the committee. A few of the more instructive reports are summarized here.

Alypin caused toxic symptoms in three cases in which it was used in the urethra in a concentration of 5 per cent or less. Apothecin caused collapse in one case after the use of a 1 per cent solution; gangrene in eight cases; and alarming symptoms in six in which it was used for sacral anesthesia.

Half an ounce of 4 per cent solution of cocain was injected by mistake into the tonsils. The patient became blue and rigid in three minutes, but the pulse was fairly good. The stomach and colon were washed, and chloroform and "a full dose of morphin hypodermically" were administered, after which it is reported that the patient relaxed. Artificial respiration was maintained for half an hour. Recovery followed. This report is of interest chiefly because it illustrates the useless and even dangerous measures so often employed to counteract the poison.

Convulsions occurred in one case after the use of cocain in the eye. Various symptoms, such as fainting, col-

lapse, photophobia, rapid heart, thready pulse and talkativeness, are also reported after the use of cocain.

Cocain was used in the urethra in concentrations up to 10 per cent, causing symptoms of poisoning in numerous cases. Syncope occurred in one case after the injection of a solution of less than 1 per cent of cocain for the extraction of a tooth.

Procain was used in the urethra in nine cases in solutions of 4 per cent or less with minor toxic effects.

Eighty cubic centimeters of 1 per cent procain solution were injected rapidly for sacral anesthesia in one case. There were cyanosis, nausea, vomiting, and thready pulse lasting about ten minutes. Half an hour later, 20 c.c. was injected without inducing further toxic symptoms.

The committee received much valuable information in the comments of many who report no accidents in their practice. Some state most emphatically that they do not use cocain because of its toxic action, and many others imply as much. Among those who reported no accidents to Dr. Randall (urology), 121 expressed their choice of a local anesthetic. Of these, only eight use cocain exclusively for urethral anesthesia; twenty-seven others use it occasionally; while fifty-three state that they will not use it at all, eighteen of these having used it formerly. About seventy use procain exclusively or almost exclusively, while ninety-three use it mainly; seven use alypin and four apothetin mainly."

The local anesthetics producing toxic effects that were fatal were used in 20 cases for tonsillectomy, in 6 for cystoscopies and urethral strictures, in 3 for operations on the nasal septum, in 2 cases each for operations following burns and for laparotomies, and once each for 8 other conditions. In no case did fatal results occur from use of the local anesthetic in or about the eye, altho nonfatal toxic cases were reported.

MISTAKES

"The present investigation brought out the fact that a death previously reported as being due to procain was

actually caused by cocain, and two of the deaths reported here were caused by cocain which had been substituted for procain by mistake. An analysis of the solution used in one of these cases showed that it contained 15 per cent of cocain. At the request of the chairman, Dr. Puckner of the Chemical Laboratory of the American Medical Association agreed to examine any solution of an anesthetic, the identity of which was in doubt, which had caused a serious accident.

The dangers of substitution of cocain for procain (resulting from verbal orders pronounced indistinctly) cannot be emphasized too strongly. Especial precautions should be taken to avoid such mistakes, which have not only caused several deaths, but also numerous accidents of less serious nature.

SYNERGISM: THE ROLE OF EPINEPHRIN IN COCAIN POISONING

There is much uncertainty concerning the rôle of epinephrin in cases of death following its use with cocain, and a dose of 1 mg. of epinephrin alone may cause pronounced symptoms of intoxication in an adult during certain disturbances of the nervous system (hyperthyroidism?).

Ross reported that epinephrin greatly increases the toxicity of cocain for cats by intravenous injection, basing his conclusion almost entirely on the amounts required to stop the respiration. Ross's conclusions throw little light on the therapeutic use of epinephrin with cocain, and the committee wishes to state that epinephrin in very small amounts does not increase the toxicity of procain when injected into the subcutaneous tissue or about a nerve."

In the report of the committee, the following points require emphasis: 1. The committee has been able to collect and analyze reports of forty-three unpublished cases of death by local anesthetics. 2. Such accidents are more frequent than is commonly supposed. 3. The ordinary channels of medical publication do not obtain this information as successfully as a special professional committee. 4. Accidents oc-

cur with the more recently introduced synthetic anesthetics as well as with the older agents; and the symptomatology is very similar in all. 5. Dyspnea and the arrest of respiration within a few minutes after the administration are especially characteristic; so much so that it is questionable whether later deaths can be charged to anesthetics. 6. Unexplained differences of susceptibility probably exist, but the committee believes that the observance of the concentrations recommended will reduce the risks very materially, if not altogether. This does not question the right of the surgeon to depart from these concentrations. But he may see that, in exceeding them, he is treading on dangerous ground. 7. A proportion of cases is still referable to avoidable mistakes for which definite remedies are suggested. 8. In the treatment of accidents, the first place must be assigned to artificial respiration, perhaps with cardiac massage. The usefulness of adjuvant measures has not been established clinically. 9. The committee advises strongly against the routine use of morphin and epinephrin in the treatment of accidents. This is not to be interpreted as a criticism of the proper use of morphin *before* operations to quiet nervous patients, nor in the addition of epinephrin to the anesthetics *before* injection to diminish the absorption of the anesthetic agent. 10. The reporting of such accidents is a duty which the physician owes to others as well as to himself; to others because the study of such information is at present the only means by which accidents may be reduced; to himself, because the prompt report of the facts to a confidential professional committee is one of the best means of guarding against unjustified suits for malpractice."

ANNOUNCEMENTS.

LONDON CONGRESS, 1925.

A convention of English speaking ophthalmologic societies will be held in London, July 14 to 17, 1925, under the auspices of the Ophthalmological Society of the United Kingdom and its Affiliated Societies.

It will be presided over by Mr. E.

Treacher Collins; and Mr. C. B. Goulden, O. B. E. has been appointed General Secretary.

The following three committees have been nominated:

Finance and Registration:

Chairman, Sir Arnold Lawson, K. B. E., Secretary, Mr. Leslie Paton.

Scientific Business and Publication:

Chairman, Sir John H. Parsons, F.R.S., C.B.E. Secretary, R. Foster Moore, O.B.E.

General Arrangements and Entertainments:

Chairman, Sir William Lister, K.C.M.G. Secretary, J. F. Cunningham, O.B.E.

Four mornings, two afternoons and one evening will be devoted to the scientific work of the Convention.

The Bowman Lecture will be delivered by Sir John H. Parsons.

A Discussion will be held on "Microscopy of the Living Eye."

A symposium is being arranged for by selected speakers on "The Evolution of Binocular Vision."

One afternoon will be set apart for visits to institutions of ophthalmic interest in and about London.

During the Convention various receptions, a garden party and a banquet will be held; it will conclude with excursions to Oxford and Cambridge.

The registration fee for those who are not members of the Ophthalmological Society of the United Kingdom will be two pounds, and for ladies accompanying members of the Convention who wish to become associate members, ten shillings.

EXAMINATIONS.

The Committee in Oto-Laryngology, appointed by the American Academy of Ophthalmology and Oto-Laryngology to examine candidates for entrance into this Society, will hold an examination in Chicago at the North Chicago Hospital, 2551 N. Clark St., on Friday, June 13, 1924, at 10 A. M. This examination is for the purpose of accommodating those who will not find it possible to report at the regular stated examination which will be held in Montreal on September 15 at the meeting of the Academy.

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JEAN MATTESON, Room 1209, 7 West Madison Street, Chicago, Ill.

THE DANGERS OF ANESTHETICS.

"When we give a patient an anesthetic we carry him to the brink of the grave and hold him there," was the saying of a famous surgeon of the last generation. He spoke of general anesthetics; for local anesthetics were then unknown. A reason for the eager heralding of local anesthesia was the hope to escape the danger of deaths from a general anesthetic. But it was soon found that local anesthetics had dangers of their own; and that by their use the danger of fatal ending was not wholly escaped.

The early years of cocaine anesthesia saw many deaths due to cocaine. Each claimant for the place, that cocaine holds, has been put forward with the more or less emphatic claim that it was less dangerous. But a wider experience has proved that each new anesthetic carried the possible danger of death, all the greater menace because not so well understood. It should be recognized that with anesthetics, as with all other drugs, anything capable of doing great good in the body is also capable of doing great harm, and is therefore only to be used with supreme caution and watchfulness.

In this connection, the paper, and the discussion that followed it, on "The Toxicity of Local Anesthetics with the Report of Two Deaths from Butyn," which appeared in the 1923 volume of the Transactions of the American Academy of Ophthalmology and Oto-Laryngology should be read with great interest by every practitioner of the "head specialties." It shows how real and imminent are the dangers we encounter, even when we use wisely and cautiously any efficient local anesthetic. No length or extent of personal experience with such anesthesia can guarantee against its inherent dangers. Every reminder that such dangers are inherent in our methods should be heeded and welcome. It is the highest kind of service that a colleague can render to us, when he manfully reports his own terrible experience of such an accident.

Such cases are not generally reported. It is startling to learn that the Committee of the A. M. A. has details of 41 cases of death from local anesthetics that have occurred in the last three years. The report of this committee is elsewhere taken up in detail. It is to be hoped that such a committee will hereafter always be in readi-

ness to receive the confidential details of such cases, to weigh the facts and pass them on, impersonally, to the profession; without exposing the unfortunate agent of such mischance to unjust criticism or suspicion. The individual doctor should be protected by secrecy; but the scientific facts in every detail should be made available to every practicing physician.

The dangers of local anesthetics are not limited to the possibility of killing the patient. Every series of experiments on animals, made to study this point, shows that they are quite capable of causing lasting damage to tissues with which they come in contact. Much clinical evidence pointing in this direction has been overlooked. The writer recalls one case in which the vision of an eye was certainly lost by corneal opacity thru repeated instillations of cocaine solution to control the pain following a slight abrasion. In other cases the improvement, amounting to a complete reversal of the tendency of a corneal ulcer, on stopping such instillations, has strikingly illustrated the danger of placing such solutions in the hands of patients, who do not know of the risk the danger that attends the relief they may afford.

There can be no question, that during the first years of its use, local anesthesia for cataract extraction was frequently followed by complications directly traceable to the anesthetic, until the principle of using as little of the drug as would serve its purpose was wisely adopted by the operators of thirty to forty years ago. There is reason to fear that operators, who have never seen the operation done in any other way, may forget this lesson that the early experimenters with local anesthesia were qualified to draw from their experience. The same danger attends the practice of using these same drugs for local production of akinesis.

One other point that should be borne in mind and carefully investigated, is the danger of combining a local anesthetic with other powerful drugs. The alkaloids all seem to have selective actions; such are familiar in the control of the pupil by eserine or

atropine. Lippincott has shown (A. J. O. 1923, v. 6, p. 631) that on the eye, other drugs are rendered more effective by association with local anesthetics. The anesthetics have their effects greatly increased by association with adrenalin; and of the selective affinities of these drugs for vital parts of the central nervous system, we know very little. Both the few things we know of the local anesthetics we use, and an appreciation of how many facts about them we are probably ignorant of, should make us doubly cautious in applying in association two or more substances capable of powerfully affecting vital processes.

The dangers of custom and habit are always with us, and grow with our personal experience. It is easy to forget the dangers that may lurk in that realm of ignorance that we cover by use of the word idiosyncrasy, which carries an implication that somehow this kind of ignorance is unavoidable and therefore excusable. Unavoidable ignorance may be excusable in a sense, but to forget that there are dangers that we cannot estimate, and do not understand, is never excusable. If our own experience has been fortunate, there is all the more need to check and correct it by that of colleagues to whom fortune has been less favorable.

E. J.

REFERRED PATIENTS AND PROFESSIONAL COOPERATION.

In the official organ of the House of Delegates of the American Medical Association, there are brief signed articles of an advisory type. These like editorial writings are usually well digested and are evidently prepared with the idea of uplifting the profession.

In the January, 1924, issue is one by Dr. Nutt of New York, recommending that "specialists shall receive only patients who are referred to them by recognized physicians." Truly a consummation devoutly to be wished—a dream like that of Sir Thomas Moore in the days of 1516, possible only in such a millennial utopian state, one in which the physician would be a paid

official of the Government and not a such self sufficient individual as now. "Why see my family doctor first and pay him a fee when I know the trouble is in my eyes?" asks the patient. Really the suggestion is not practical in this day and age!

The specialist welcomes the professionally referred patient, rather than a new client coming directly or from another patient. In such a case he knows that he has not only to relieve the patient of his failings, but also has to please the doctor who sent him. He therefore is in the mood to give this particular patient his particular care. He should make an immediate report to the family doctor, concerning not only the ocular findings and their relation to the general health, but also refer to conditions which may have been elicited during the examination which may be relieved by the general practitioner, and call the patient's attention to the advisability of such a consultation.

But there is a want of team work. The all round medical man—the general practitioner, as time has shown, may know a little about everything in the disease line, but can not know much about any one specialty which may take years of application to even begin upon. Ask almost any "specialist," has there not been a marked falling off of referred patients since the World War at least? Ask the pediatricist, the internist, the ophthalmologist, the skin, nerve or nose and throat man!

Be it a want of education or a lowering of the morale or what, there has been a marked widening of the general practitioner's specialty of general practice within the last few years, particularly evident in some who made money during the war, but have not made so much since. Because at that time there was not sufficient medical civilian service for civilian practice, they may have done certain emergency special work and think they learned to do it as well as the specialist. Or some of the younger fellows have heard a few lectures on the eye, ear, throat or what not, and have seen a special surgeon do a squint opera-

tion, or take a foreign body out of the eye or throat, or take out tonsils. It looks easy and takes only a few minutes and the time itself is well paid for. So they go ahead and do these things; in a way it is true, but which is not always for the best interests of the patient. They do not know that before the ophthalmic surgeon corrects strabismus by operation he first exhausts all possible means of inciting the visual and muscular centers of the brain to acquire binocular vision; that the removal of a foreign body from the cornea by the skilled oculist is always accomplished safely, with no destruction of tissue and that there has been yet to hear of an infection of the eye at his hands. Whereas corneal ulcers and occasional loss of the eye are not unheard of events when first attended to by the ordinary practitioner. Then too, anyone thinks he is able to take out tonsils, for a rather small honorarium with which the throat man must compete, despite that this is a capital operation. Certainly few tonsil cases are referred to the specialist by the general man. They keep all they can and take the money while the patient takes the risk.

If the average head surgeon, skin doctor or nerve specialist would look over his references, he would undoubtedly see that about one in ten of his patients come to him by direct medical reference. The specialty of ophthalmology is so well defined nowadays that one of the laity having trouble with his eyes usually goes first, perhaps on the recommendation of his family physician, to a spectacle seller; and upon the failure to get relief goes to the oculist.

The eye man undoubtedly refers more patients direct to the general doctor than he ever gets from the latter. While we are fully qualified physicians and surgeons we restrict our treatment to our specialty. Altho the specialist in any branch of medicine ought to have, and generally does have, a very good knowledge of general medicine, in addition to his superior knowledge of his specialty, as a rule he is not accredited with this knowledge by the general practitioner.

The ophthalmologists are received as equals in medical associations, but is there not a little mental reservation, a secret evasion of mind, just as there is in the case of the dentist? They forget that we too are all round medical men; just as well or better qualified to practice general medicine, as we were before we gave it up to enter into a restricted practice, and still perhaps as good as the average run of general practitioners.

The dividing up of local medical societies into special groups may have widened this gap. We miss the club-like personal association of former days. Some of the city and county societies have realized that division of meetings into groups of specialists does not work well for the common good, and they are going back to the more democratic organization.

Well selected addresses on special subjects relating to general conditions, delivered by specialists before general meetings of the local societies, may keep their confreres advised of the relations of the specialty to general medicine and are decidedly needful for the education of the general practitioner. The specialists too need the new knowledge acquired in general practice. As it is now there are practically no general medical men attendant upon special meetings, and the specialist is conspicuous by his absence in the general meetings, unless social entertainment features are included.

Then again the specialist, particularly the ophthalmologist, should constantly call the attention of the general practitioner to the advantages gained by the patient by consultation, and the association of eye lesions with general diseases, and the very complete character of the examination given to the ophthalmic patient, in even a simple refraction case, in many of which a doctor is needed rather than a spectacle fitter. The patient's attention is called to systemic conditions thereby and he is often returned to his general advisor for further study and treatment. The general medical man always gains by such references and never loses.

Perhaps then if the medical man will wake up and learn that his patients are best cared for by frequent consultation, the day may come when the specialist can afford to refuse all patients excepting those who come with the approval of their medical man.

H. V. W.

BOOK NOTICES.

The Relative Position of Rest of the Eyes and the Prolonged Occlusion Test. F. W. Marlow, M. D., M. R. C. S. Eng., F. A. C. S., Professor of Ophthalmology in the College of Medicine, Syracuse University. Small 8vo. Cloth, 104 pages, illustrated with original diagrams and charts. Philadelphia, F. A. Davis Co., 1924.

The essential character and details of the prolonged occlusion test have been placed before the readers of this journal in an article by Dr. Marlow (v. 4, 1921, p. 238.) This volume sets forth, in more detail and in graphic form and text discussions of his method, the results he has obtained with it, in the diagnosis of latent ocular deviations, and in the subsequent treatment of cases so studied. The illustrations include sixteen tables and eleven charts or graphs, which help to give a comprehensive view of these results.

The thoro analysis of the material on which the book is based is indicated by the titles given the various chapters. These are: Introductory, The Method, The Relative Position of Rest, Orthophoria, Tabulation and Analysis of Cases and Some Inferences Drawn, Muscle Balance in Relation to Refraction, Age, Heredity and Evolution, Abduction, Indications for the Use of the Test, Effects of Occlusion on Symptoms, Near Point of Convergence, Treatment.

The material for this study includes records of seven hundred cases to which the test was applied. The period of occlusion was seven days in four hundred and thirty-eight cases. It was from one to six days in eighty-seven, and from eight to twenty-seven days

in one hundred and sixty-five cases. The position of rest, as shown by such occlusion was:

	Per cent.
Parallelism	3.4
Divergence without hyperphoria..	12.2
Convergence without hyperphoria	2.2
Hyperphoria without lateral deviation	5.6
Divergence with hyperphoria....	65.4
Convergence with hyperphoria....	11.
Total divergence	78.
Total convergence	13.2
Total hyperphoria	82.

These proportions are based on the largest number of such painstaking tests that have thus far been reported. They may be taken as representing the run of patients who consult an oculist for asthenopic symptoms. Of course, they probably do not represent the proportions in the general community.

Very interesting and of practical value is the short chapter on treatment. The views expressed in it seem conservative, but clear and not unduly pessimistic. He says: "The general condition of health of the patient, including the reserve of nervous energy with which he was endowed at birth, has a large influence, beyond any doubt, in determining whether a given form or degree of muscle imbalance will give rise to symptoms or not. A great many people are the subjects of faults of this nature without giving any symptomatic evidence whatever of their presence. On the other hand symptoms of very marked character arise in patients of the neurotic type or of a low state of general health, from errors of very low degree, and it is consequently advisable to correct such errors in the presence of otherwise unexplained symptoms."

The general methods of treatment are thus classified: "(1) Exercises—prism or other. (2) The constant wearing of prisms to permit the visual lines to fall into, or approximate, their anatomical position of rest. (3) Operative treatment."

In regard to exercises he says: "In spite of the widespread use of various methods, with the underlying principle of strengthening the supposedly weak muscles or stimulating the nerve

centers, very few well-authenticated cases of improvement by this method in the hands of others have come under my observation, and in these few the benefit has usually been temporary only. In my own practice benefit has been still more exceptional tho not entirely absent. Even in cases of convergence insufficiency, which would seem to be especially suitable for this method, any material improvement has been rare, tho cases have occurred in which satisfactory improvement both in the near point of convergence and symptoms have resulted. When I prescribe exercises now, it is less with the expectation of benefit than for the purpose of determining by actual trial its futility in the particular case in point, and leaving the field open for the adoption of some other more promising method of treatment."

As to wearing prisms, he says: "My experience in the prescription of prisms for constant wear has been far more satisfactory, extending over a long period of years, during which the series of 700 consecutive cases upon which this essay is based constitutes only a fraction of the total number of cases observed. This experience leads to the following suggestions:

"That in low degrees of exophoria, i.e. up to 4° or 5° (refracting angle) the greater part or all the error found after occlusion can often be corrected with advantage. I have ceased to consider some of the lower degrees as of no importance. The prismatic correction of even 3° has been followed by surprisingly good results."

On the whole, this work may take its place beside the little works of Maddox, as one that affords real information in regard to disorders of the ocular movements, and practical help in dealing with them.

E. J.

Die augenärztliche Therapie. By Dr. Ernst Franke, Extraordinary Professor of Ophthalmology, Instructor in the Eye Clinic, University of Hamburg. Paper, 146 pages. Berlin, Julius Springer, 1924.

This little book is a sort of pocket dictionary of ophthalmic therapeutics,

a subject often badly neglected, as the "foreword" points out. It will serve as a summary, and reminder of what is known of its subject; and so help to a practical mastery of the therapeutic resources of the present time.

It is divided into two parts. The first, a general part, begins with general therapeutics, under the headings: Tuberculosis; Syphilis; Serum and Organ Therapy; Paraspecific Protein and Stimulant Therapy; Light and Radiotherapy; Electrotherapy; Medication; Cold and Warm Douches, Baths and Water Cures. Then, local or topical therapeutics are considered under these heads: Mechanical Treatment; Warm and Cold Applications; Light and Radiotherapy; Local Medication; Serotherapy and Electrical Treatment.

In the "Second Part," the matter is arranged by regions, thus: Lids, Conjunctiva, Lacrimal Apparatus, Cornea, Sclera, etc., ending with Injuries and the Eye Muscles. The chief diseases of each part are mentioned, as under: Sclera, Scleritis, Episcleritis and Episcleral Tumors; and under each disease a list of remedies available to combat it. Thus, for convergent strabismus, we have: Lenses Determined under Cycloplegia, Exercises for the Amblyopic Eye; Atropin in the Fixing Eye; Exercises Mechanical and Steroscopic, and Operations. There is a two page list of contents and an index of almost equal length.

The most generally interesting part, perhaps, is the twenty-four pages devoted to local or topical medication. There are five pages discussing the various forms in which medicaments are used locally, as drops, salves, powders, caustic pencils, tablets, irrigating solutions and subconjunctival injections. Then various drugs are given in alphabetic order, with a list of conditions for which they are to be applied, beginning with acetic acid, and ending with zeozon.

For those who read German, this little book should prove a very useful reminder of things that could be done for any given condition. It will be valuable in proportion to the breadth

of individual reading and experience in ocular therapeutics which this key or guide will help the reader to render available.

E. J.

American Academy of Ophthalmology and Oto-Laryngology. Transactions of Twenty-eighth Annual Meeting. Cloth, 545 pages, 11 plates, 2 in colors, 127 illustrations. Chicago. Published by the Society.

These transactions are divided into three parts—those of the "Ophthalmologic Division," those of the "Oto-Laryngologic Division" and those of the "Joint Session." These are, this year, nearly equal in size and present some interesting and important papers relating to ophthalmology. The first of these is "The Toxicity of Local Anesthetics with the Report of Two Deaths from Butyn" by A. E. Bulson. We refer to this subject elsewhere (p. 481). "The Treatment of Optic Nerve Involvements as Determined by Optic Canal Radiographs" by L. E. White, gives the results of some original research. "The Life History of the Human Lens" by E. E. Blaauw, is based on the revelations of the slit lamp; and A. J. Bedell reports "A Study of the Cornea with Slit Lamp and Microscope."

The "Oration" by Sir William T. Lister takes up "Concussion Changes Met with in Military Practice." It is profusely illustrated, with half-tones and two colored plates. It discusses in succession: Ruptures of the Sclera, Concussion Changes of the Iris and Ciliary Body, Concussion Changes of the Retina and Optic Nerve, Evulsion of the Optic Nerve, and the Effects of Foreign Bodies Striking the Retina. Then there are good papers on "Cellulitis of the Orbit in Infants and Children" by K. A. Phelps; and on "Contributing Factors in the Etiology of Myopia" by H. B. Lemere.

All the above were presented at the joint sessions. Before the Ophthalmologic Division, thirteen papers were read by well known contributors to the literature of ophthalmology. All of them will repay careful reading, and

nearly all brought out valuable practical discussions.

The Oto-Laryngologic Division was similarly productive of good literature. The Academy and its Transactions have an established reputation for scientific work, and it is well sustained by this volume.

E. J.

Transactions of the American Ophthalmological Society. Fifty-ninth Annual Meeting, Colorado Springs, 1923. Volume XXI. Cloth, 428 pages, 27 plates, 3 in colors, 8 illustrations. Philadelphia, published by the Society.

The American Ophthalmological Society is, with one exception, the oldest society in the world purporting to be nationally devoted to a special branch of medicine; and it is the one that has held the largest number of meetings. But this volume gives the proceedings of the first meeting it has held west of the Allegheny Mountains. In 1877 it attempted a meeting at Niagara Falls, N. Y., which was not held because only six members were in attendance, and in 1876 it omitted its own meeting because that year the International Congress of Ophthalmology met in New York City. With these exceptions one of its meetings has been held every year since it was founded in 1864.

The volume includes twenty-four papers read at the meeting, of which twenty-one are followed by discussions. There are also four theses of candidates for membership, reports on the undergraduate and graduate teachings of ophthalmology, three sketches of deceased members, descriptions of new instruments and pathologic slides exhibited, minutes, lists of members, indexes, etc. Both its contents and the manner in which they are presented make it one of the most desirable of the annual volumes that come to increase our libraries relating to ophthalmology. Of the theses it includes, we hope to publish a special report.

E. J.

CORRESPONDENCE.

Expression vs. Extraction.

To the Editor: In spite of occasional protests by the writer, and others, the great majority of English speaking ophthalmologists continue to talk of the *extraction* when they mean the *expression* of cataract.

A cataract is extracted when it is drawn out of the eye by means of a hook, loop, spoon, needle, forceps, or some sucking instrument. Aside from these extractions, practically all the other operations by which a cataract is immediately removed from the eye are *expressions*. And yet, altho the latter probably make up 90% or more of all cataract removals, the "expression" of cataract is not mentioned in any of the half dozen standard textbooks (including the American Encyclopedia) which I have consulted. The absurdities into which this perverse convention may lead, is strikingly illustrated by the following from the March number of this Journal (p. 221): "Intracapsular extraction by expression methods invariably produced irritable slow healing eyes. Intracapsular extraction by traction produces considerably less reaction."

The right of the matter is so ridiculously obvious that one feels somewhat sheepish in calling attention to it; but the profession is so stodgy over it, that it really seems as if some formal action ought to be taken by our learned societies, in favor of a reform which is so easy and so important.

HAROLD GIFFORD.

N. B. The Germans, French, *et al* are no better.

BIOGRAPHIC NOTICES.

DR. FERNANDO LOPEZ, an ophthalmologist of Mexico City, died recently in his home city after a prolonged stay in Texas, during the Mexican revolution. Dr. Lopez was a well known operator and had an extensive practice in Mexico City for many years. He was one of the founders of the Mexican Ophthalmological Society and contributed several

important papers to the literature of our specialty.

He was one of the first to use fat transplantations after enucleation and evisceration, with very gratifying results. In 1901, he advocated the use of local anesthesia for all ocular operations.

For many years, Dr. Lopez was Director of the Military General Hospital in Mexico City, where a school of medicine was established for the training of military surgeons.

He was of a very pleasing personality and very much interested in medical education. M. URIBE TRONCOSO.

PROFESSOR SAMUEL EPERSON, who died in Lausanne, August 5, 1923, aged 64 years, had been Director of the Ophthalmologic Clinic. Born at Féchy he studied Medicine in Leipsic, Würzburg and Paris, where he became assistant to Landolt. He received his Doctor's degree in Berne, and in 1888 became oculist to the University Polyclinic at Lausanne. In 1908 he succeeded Marc Dufour to the professorship. His more important scientific contributions dealt with tenotomy and advancement for high degrees of squint, the myopia operation, retinal detachment, management of the malingeringer, corneal ulcers, correcting glasses for keratoconus and the abortive treatment of serpent ulcer with zinc sulphat. He reported a case of hemichromatopsia. A schoolmate speaks of him as grave, timid, of few words, but of radiant intelligence.

DR. ADOLPH VON SZILY. Hungarian ophthalmology suffered a great loss with the death of Prof. Dr. Szily, who died at the age of seventy-three, on the 20th of November, 1920.

Dr. A. Szily, Professor of the Royal University of Budapest, head of the Ophthalmologic Department of one of our greatest hospitals, had worked during 41 years, had restored the sight to many thousands of patients, had instructed many eminent pupils and had earned by his scientific works the appreciation of foreign scientists.

His morphography of the papilla nervi optici must be mentioned in the

first place. It was published at Wiesbaden by Bergmann. For the atlas he himself designed and colored the pictures of the eyeground with utmost precision, and in a highly artistic manner. He intended to treat the same subject in the great manual of Graefes-Sæmisch. The material was collected, and it will be published by his eminent son, Dr. Aurel Szily, an ophthalmologist too, who is an Extraordinary Professor and assistant to Prof. Axenfeld at Freiburg in Germany.

His memory will last for many years in science.

DR. J. FEJER.

NICOLA SCULCO was born at Strongoli in 1873, and studied medicine at Naples under de Vincentiis. In 1900, he went to Catanzaro as director of the laboratory of public health. It was here that his work on trachoma was done. Finally after six years of experimentation with different drugs and herbs, he decided upon the ferment of nepeta citriodora on account of the results obtained with it. In 1916, he was awarded the gold medal of the Medical Society of Catanzaro for his work. At a conference on trachoma in Cairo in 1920, he recounted his experiences in arriving at his method and the results obtained with it. The writer joins other colleagues in appreciation of the results obtained by the Sculco method. (Archivio di Ottalmologia v. 29, p. 283.)

G. ADDARIO LA FERLA.

CLEMENS HARMS, extraordinary professor of ophthalmology in the University of Tübingen, died in military service in Shirardow, Poland, July 23, 1915. Wounds by shrapnel, a chest wound with pneumothorax, two abdominal wounds and two thigh wounds received several days before in the mountains, culminated in a fatal ending. He was buried in Shirardow.

Harms was born the 23d of September, 1875, in Hanover, and studied in Tübingen, Berlin, and München. In München in 1900 he was honored with approbation and promotion. He spent two years with Uhthoff in Breslau, from whom he received especial notice of his work, and was enabled to work with Willibald Nagel in Berlin. He

was later assistant doctor in the Tübingen Eye Clinic.

Besides his smaller works in casuistics and anatomy, he contributed to the scientific knowledge of the pathology of the central vascular system of the retina. In his last publication in volume 87 of Graefe's Archives, shortly before the war, he reported further studies of the same subject. He had also taken up studies of great literary value on other planes which were interrupted by his death. All of his

works on the above themes show themselves to be careful critical reviews of the clinical material which he collected.

Harms had an open happy nature, full of worthy humor and irrepressible optimism. As an inspired teacher he enabled his pupils to acquire a large amount of knowledge, and they will not forget him. His friendly eyes awakened confidence in the hearts of those who came to him for aid.

G. VON SCHLEICH.

ABSTRACT DEPARTMENT

Reprints and journal articles to be abstracted should be sent to Dr. Lawrence T. Post, 520 Metropolitan Building, St. Louis, Mo. Only important papers will be used in this department, others of interest will be noticed in the Ophthalmic Year Book.

Leconte, M. and Joltrois. Iritis and Optic Neuritis in Infectious Jaundice. Bull. de la Soc. Méd. des Hôp., Paris, 1923, 47, pp. 1366-3169.

According to Weekers and Firket, among fifty cases of infectious jaundice, iritis and iridocyclitis occurred six times, iritis and neuritis twice, and iritis and retrobulbar neuritis once.

Leconte and Joltrois report the case of a man, aged twenty-four, with fever, jaundice, petechiae on the thighs and flanks, profound prostration, cutaneous hyperesthesia, muscular hyperalgesia, stiffness of the neck, and Kernig's sign, in whom the diagnosis of ictero-hemorrhagic spirochetosis was confirmed by a positive serum. Twenty-four days after the onset, when his general condition was improving, he developed a bilateral iritis. The Wassermann reaction was negative. The right eye was practically normal again in eight days and the left eye in twelve. On the sixteenth day, when the iritis was entirely healed, ophthalmoscopic examination showed, in the right eye, a little congestion of the optic papilla, and, in the left eye, the papilla reddish and poorly defined and the retinal veins slightly dilated and dark. Six days later, the right eye showed a hyperemic papilla and dilated veins, but no edema; the left eye showed a typical neuritis, mild edema of the papilla and peripapillary retina and dilated and tortuous retinal veins. The visual field was

normal for form except for slight contraction above in the left eye; the field for green was normal, that for red was contracted about twenty degrees in all directions. The blind spots were normal. There were no scotomata. At this time, the spinal fluid was clear and contained two to four lymphocytes per c.c. and 0.40 albumin. The Wassermann and colloidal benzoin reactions were negative. The neuritis improved considerably in the next few days; and, on the forty-eighth day after the onset of the disease and the tenth day after the appearance of the neuritis, the patient was discharged in good condition.

According to the authors, the points of interest in this case are the short course of the disease with only one recrudescence, the rather late appearance of the iritis (twenty-fourth instead of tenth to fifteenth day), the short course of the iritis, and the onset of the neuritis during convalescence, after the meningeal signs had disappeared and when the spinal fluid was negative.

H. P. W.

Sondermann, G. Ocular Disturbances in Congenital Ichthyosis. Klin. M. f. Augenh., 1923, v. 70, p. 180.

A girl, aged 13, suffering from severe congenital ichthyosis of the whole body presented ectropion due to the shortened ichthyotic lid, lagophthalmus, epiphora, conjunctivitis with diplobacilli and a

large ulcer of the left cornea with hypopion. The ulcer perforated on the fourth day, but healed under zinc solution in three weeks, with $V=6/10$. On account of the poor nutrition, intermittent fever, due to tuberculosis of the lungs and intestines, the prognosis was unfavorable, as in all such cases. As the ichthyosis was universal, only a homoplastic transplantation for the necessary protection of the eyes from the parents or children of the same family can be recommended. Symptomatically, goggles or celluloid capsule spectacles, ought to be worn.

C. Z.

Riddell, B. Early Ocular Manifestations of Disseminated Sclerosis. *Glasgow Medical Journal*, 1923, v. 100, pp. 302-310.

Riddell regards transitory diplopia and acute retrobulbar neuritis as among the earliest symptoms of disseminated sclerosis, occurring sometimes a year or more before any other demonstrable objective findings. As a typical example of the diplopia, he reports a case of paresis of the right external rectus which appeared in an otherwise healthy man, aged twenty-five years, and which lasted about six weeks. Following this, there was gradual failure of vision with slowly developing pallor of the discs and optic atrophy. In five months, vision was reduced to 6/60 and 6/24 in the right and left eye respectively; and, in the presence of nystagmus and other signs, a definite diagnosis of disseminated sclerosis was possible.

Of twenty-nine patients with diplopia, Riddell found that eleven had syphilis; four, lethargic encephalitis; five, central vascular degeneration; one, a head injury; one, ophthalmoplegic migraine; and four, disseminated sclerosis. In the others, no definite diagnosis was made.

The acute retrobulbar neuritis is usually unilateral, is associated with pain on moving the eye, and is apt to improve considerably in two or three weeks. It may be recurrent. The author cites two typical cases. In an apparently healthy woman, twenty-six years old, the vision of the left eye was suddenly reduced to 6/60. The fundus was negative. In a month, the vision had returned to 6/6.

Fifteen months later, there was a suddenly acquired central scotoma in the right eye. The margins of the optic disc were blurred and the retinal veins were full. In the left eye, vision was 6/18 and there was definite pallor of the disc. Later, the patient developed a typical disseminated sclerosis.

Another woman, aged twenty-four, was seen because the vision in her left eye had suddenly been reduced to the ability to count figures. Vision returned to normal in three weeks. A year before, she had had a similar attack which lasted two weeks. Four months later, there developed paresis of the left external rectus and neurologic signs of disseminated sclerosis.

According to Riddell, nystagmus and optic atrophy are found as a rule only when other symptoms of the disease are present, tho the nystagmus, which is symptomless, may appear early and may be transient.

H. P. W.

Gifford, Sanford R. Intracisternal Injections in Treatment of Luetic Optic Atrophy. *Brit. J. Ophth.*, v. VII, no. 11, 1923, p. 506.

Mindful of the more or less accepted view that simple luetic atrophy is unaffected by treatment, the author approaches this subject with no little temerity. An experience with one patient led him to try out certain lines of treatment on a series of similar cases. The first experience was with a man, aged forty-eight years, who had had antisiphilic treatment for fifteen years. Blood Wassermann, negative past fourteen months. Spinal fluid not examined. Failing vision in the right eye eighteen months, in the left ten days. Both nerves showed simple atrophy; vision R. E. 20/100, L. E. 20/20. Right field unsatisfactory owing to a large central scotoma, left contracted to about fifteen degrees. Spinal fluid Wasserman 3+. Under mercurial treatment for a week his vision and fields were still further reduced. He was referred to Suker of Chicago who administered four injections of 1/50 gr. mercury bichlorid in the lateral ventricle. Ten months later the author again saw the patient. Vision was 20/15 in both

eyes; left temporal field thirty-five degrees, and the right ten degrees.

Following this experience, putting the case in none too favorable light, to five patients with luetic optic atrophy, where vision was still useful in one eye, injections into the basal cisterna of 1/50 grain of bichlorid were administered. Each case of the series is reported in detail. In addition to the injections, mercurial inunctions, potassium iodid and salvarsan were administered. Clinically, there was a marked improvement in vision and fields, one, however, being only temporary. A review of many of the theories of the pathogenesis is discussed. If an active luetic process is at work, the possibility at least exists, as in any other luetic process that it may be stopped if the spirochetes can be killed. It cannot be expected that nerve fibres already destroyed will be repaired, and some fibres already injured may go on to complete degeneration, but if the active process is stopped, those fibres which remain should survive, and vision should suffer very little further loss. It is even thinkable that an absorption of infiltrate from between the nerve fibres may allow some slightly damaged fibres to resume their function.

Conclusions:—1. Intracranial injections of mercury bichlorid have given, in our hands, better results than other methods previously tried. Several cases have apparently been brought to a standstill with useful vision for periods of one to two and a half years. A negative Wassermann has often been obtained by such treatment. 2. Intracisternal injection is a relatively simple and safe procedure. 3. Improvement in vision, especially following the first injection, as seen in five cases, is presumptive evidence of the presence of an active infiltrative process in these cases. 4. Best results may be expected in early cases, with definite defects in part of the field, but with relatively good central vision, at least in one eye, and with little evidence of other nervous involvement. 5. Results would not be expected in late cases, or in advanced cases of paresis. The more general the nervous involvement, even if the atrophy is not advanced, the less chance exists of stopping the process in the nerve.

Six perimetric charts and a bibliography of thirty-one references accompany this very excellent and instructive contribution.

D. F. H.

De Rosa, G. Anthrax of the Eye and Serotherapy. Arch. di Ott., 1923, v. 30, p. 316.

The author's patient, a woman, came in showing a typical malignant edema extending from the forehead over the entire left side of the face and neck. The lids were swollen and glued together with a yellowish serum exuding from between them, from which a positive culture for anthrax was obtained. Fever and swelling were marked. A few days before she had noticed a small bullous lesion at the inner angle of the left lower lid. The swelling had come on rapidly and now the primary lesion was entirely hidden by a turning in of the lids. With no local treatment except hot packs, anti-anthrax serum was begun at once intramuscularly. On the third day the condition was much improved and in five days the patient was discharged cured.

Another case of the more usual type of malignant pustule affecting the leg was seen at the same time and in this case prompt use of the serum with no local treatment resulted in rapid cure. The author reviews other modes of treatment from the literature and the few ocular cases in which the serum was employed. He concludes that in any case of anthrax serotherapy is the only sure and efficacious treatment. This is especially true in malignant edema where the infection has spread beyond the primary lesion. In lesions affecting the lids where surgical removal produces such destructive scars, the only surgery justified is simple incision parallel to the lid border to allow the escape of fluid.

S. R. G.

Cattaneo. Nature and Behavior of Tumors of the Retina. Ann. di Ottal. and Clin. Ocul., 1923, v. 51, p. 759.

The author considers especially the nature of the retinal tumors commonly called glioma on the basis of a complete review of the literature (123 titles in bibliography) and a careful examination of sections from 31 personal cases.

Special care was used in staining for glia, Cajal's gold chlorid and Del Rio Hortege's carbonat of silver tests being used in all cases. In none of the 31 cases were true glia fibrils demonstrated in the tumor proper. Parts of the eye normally containing glia, such as the nerve, showed the fibers well stained, as did three typical gliomata of the brain. Hence the so-called gliomata of the retina may definitely be said not to be composed of glial elements. In a few cases from the literature in which true glial fibers were reported, they were in the peripheral parts of the tumor and evidently normal retinal glia included in the tumor. Improper fixing may produce apparent fibrils but it is certain that so-called gliomata of the retina are not composed of glial elements.

The four principal theories proposed as to the origin of so-called gliomata are: 1. The glial theory. This the author believes his work has effectively disposed of. 2. Neuroepithelial theory. This is advocated by Wintersteiner who followed Flexner. He thought that the rosettes described by him were the essential elements of the tumors, and that the cylindrical cells represented elementary retinal rods and cones with an internal limiting membrane. The author found rosettes present in 11 of 31 cases. In two of these the rosette arrangement was only suggested in a few areas. In the others it was more or less pronounced. Rosettes were never found in tumor nodules developed outside the vitreous chamber. They were of various forms but no established difference could be made out between the cells composing them and the other cells composing the tumor. No sign of a limiting membrane could be made out. The author concludes that the rosettes are simply an arrangement of cells around a cavity, identical in nature with the other tumor cells, without either a limiting membrane or an especially developed form of protoplasm.

3. Sarcomatous or angiosarcomatous theory. The basis of this theory is the characteristic arrangement of tumor cells around the vessels as first emphasized by Iwanoff. In sarcomata the new formed vessels are simply canals sur-

rounded by tumor cells without a definite wall. There is also always present in true sarcoma some supporting stroma tho it may be small in amount. In the author's cases of retinal tumors, however, the vessels were nearly always seen to have definite walls which were not directly continuous with the tumor cells. No definite stroma was present, except the few connective tissue elements which could be seen to be derived from the vessel walls. The arrangements of cells in columns about the vessels, the author concludes is merely a matter of nutrition. The young cells undergo necrosis quickly, except in this region where the nutrition is abundant.

While the majority of retinal tumors are thus distinct from sarcoma, it is possible that sarcomata of the retina occasionally occur. One of the author's cases, a relatively early tumor, which affected only the retina, showed certain differences from the ordinary retinal tumors which makes it possible that it was a sarcoma. These consisted in 1, difference in morphology of cells; 2, absence of degenerative changes and extensive necrosis; 3, irregular distribution of elements and absence of rosette formation; 4, very thin vessel walls. Another objection to the sarcoma theory is that if the typical tumors were sarcomatous, they should be expected to develop at all ages, which is not the case.

4. The mixed tumor theory. Mazza, Lagrange and others, believe that both ectodermal and mesodermal elements may play a part in the tumors.

The author considers the three most characteristic facts which places these retinal tumors apart from others to be 1, their hereditary character; 2, the time of life at which they occur; 3, their characteristic structure. Concerning the hereditary characteristic of the tumors, numerous "glioma families" are quoted from the literature. Some families showed the tumors not only in members of a childship but in different generations of a family (one in three generations). As concerns the time of appearance, this is practically always in the first four years of life. Most of the author's cases were in the first two years. The fact that degenerative changes are seen

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in practically all the tumors which have been sectioned, no matter how early in life they are obtained nor how small the tumor is, is evidence, according to the author, of their origin in intrauterine life. As Cirincione pointed out, the characteristic cells of the tumors resemble those of the retina during the fifth month of fetal life. All evidence, the author concludes, is in favor of the fact that the tumors are derived from retinal elements while still undeveloped, so that the discussion as to which layer is responsible for their origin is of no importance. The tumors are peculiar to the retina, and since their cells are typical undeveloped retinal cells they can properly be called retinomata.

S. R. G.

Q. Sgroso. Epibulbar Tumors. *Arch. di Ott.*, 1923, v. 30, p. 300.

The author reports three cases of epibulbar tumors of different kinds. The first was a case of dermoid of the conjunctiva occurring in a boy of sixteen, who had only noticed a growth on the right eye for five months. The nodule was raised four millimeters above the limbus and was five millimeters in diameter. Sections of the growth after removal showed a cavity lined with stratified squamous epithelium. Inside this cavity was a fully developed dental follicle showing dentine and enamel.

The second case was a papilloma of the conjunctiva. The patient, a boy of seventeen, had numerous papillomata of the lips several years before, which had been removed. The growth on the right eye had been removed twice during the

past six months; and now was seen to be a reddish mamilated tumor, the size of a small nut, extending from the inner angle and covering the whole cornea, being raised about one cm. from the level of the cornea. A smaller growth was present on the left eye, extending from outside the limbus and covering about a third of the cornea. On removal the larger growth was found to be only adherent at the internal part of the cornea, so that the rest of the cornea was clear. Vision was improved from light perception to $\frac{2}{3}$ in this eye, and was normal in the other eye. Sections of the larger growth showed a very vascularized stroma on which were lobules of the epithelium in which all the layers of the skin were represented. The cells showed all stages of degeneration with the formation of epithelial pearls and keratin. The smaller tumor was less vascularized but showed, however, a more active proliferation, evidently having a greater tendency to malignancy than the larger growth.

The third case was an adenoma of the bulbar conjunctiva. The tumor had been noticed for six months and is now the size of a large pea, located down and out on the sclera and covered by conjunctiva which was movable over it. It was thought to be a lipoma, but on removal it was seen to be composed of tubules lined with cubical epithelium. Part of it was transparent, and in this part the tubules were considerably dilated with fluid. The site and structure of this tumor lead the author to believe that it probably represents an aberrant lacrimal gland.

S. R. G.

NEWS ITEMS

DEATHS.

Dr. Peter A. Haley, Charleston, W. Va., aged 49, died February 28th, of pneumonia.

Dr. Hiram R. Stilwell, Denver, Colo., aged 52, died April 12th, of cancer of liver.

Mr. Thomas Brittin Archer, of London, died on January 24, 1924, of angina pectoris.

PERSONAL.

Dr. J. N. Gardner, of Lodi, California, has located in Oakland.

Dr. Myles Standish, of Boston, was a San Francisco visitor during April.

Sir Anderson Critchett, Bart., K.C.V.O., has been elected Master of the Oxford Ophthalmological Congress.

Dr. George E. de Schweinitz, of Philadelphia, is scheduled to address the French Ophthalmologic Congress which convenes in Paris, May 12th.

While in this country, Sir John Herbert Parsons, of London, England, will lecture in a course for physicians to be given at the University of Washington, Seattle, July 14th to 19th.

Dr. C. M. Sneed, of Columbia, Missouri, has recently returned from a visit to Eye Clinics in Vienna, Professor Elschmig's in Prague, Dr. Morax's in Paris, and to Moorfield's.

Dr. Walter L. Vercoe of Deadwood, South Dakota, will close his office May 1st for an indefinite period of time, or until he is relieved of an attack of neuritis in his right arm.

Dr. B. F. Baer, Jr., of Philadelphia, a member of the staff of Dr. George de Schweinitz, of the Department of Ophthalmology of the University of Pennsylvania, has just been elected Surgeon to Wills Eye Hospital to succeed Dr. Peter N. K. Schwenk.

Dr. Peter N. K. Schwenk has recently resigned as Surgeon to Wills Eye Hospital. Dr. Schwenk became associated with the late Dr. Harlan at Wills Hospital in 1883. In 1897 he was elected Assistant Surgeon, and in 1907 Ophthalmic Surgeon to the Institution. In recognition of his long and distinguished service, the trustees have honored Dr. Schwenk by electing him Consulting Surgeon.

Dr. Luther C. Peter, of Philadelphia, was an honor guest of the Eye, Ear, Nose and Throat Section of the Tennessee State Medical Society, which met at Knoxville on the 8th, 9th, and 10th of April. The subject that Dr. Peter contributed to the occasion was "The Nonsurgical Management of Squint." Dr. Peter will also address the Lackawanna County Medical Society on "The Eye in General Practice," on May 20th, and with Mrs. Peter will sail from Canada late in June to visit Vienna, Switzerland, Hungary and France.

SOCIETIES.

The Buffalo Ophthalmological Club entertained at its March meeting, Dr. William Evans Bruner of Cleveland, Ohio, who treated the subject, "Intraspinal Injections of Salvar-

sanized Serum in Optic Atrophy." Out-of-town guests were present from Dunkirk and Rochester, New York, and Erie, Pennsylvania.

At the April meeting of the Kansas City Eye, Ear, Nose and Throat Society the following officers were elected for the coming year: President, Dr. S. E. Roberts; first vice-president, Dr. J. J. Dorsey; second vice-president, Dr. T. S. Blakesley; and secretary-treasurer, Dr. J. L. Myers.

The British Medical Association will hold its ninety-second annual meeting at Bradford, July 22nd to 25th. The officers of the Section of Ophthalmology are: President, A. Maitland Ramsay, M.D.; vice-presidents, R. J. Coulter, M.B., G. H. Oliver, and A. L. Whitehead; secretaries, J. D. McCulloch, and Humphrey Neame.

A meeting of the Eye and Ear Section of the Maine Medical Association was held February 7th, preceded by a dinner at the Congress Square Hotel. President Mitchell, of Houlton, presided. Papers were read by Prof. George S. Derby, of Boston, on "Glaucoma," and Dr. L. V. White, on "Blindness Produced by Infected Teeth, Tonsils and Sinuses."

At the April meeting of the Ophthalmic Section of the College of Physicians of Philadelphia, under the chairmanship of Dr. Thomas B. Holloway, the following program was given: Dr. Wm. Zentmayer, "Exhibition of a Case of Vossius Ring Cataract with an Unusual Pathogenesis"; Dr. Luther C. Peter, "Exhibition of a Case of Unilateral Hemorrhagic Neuroretinitis Due to Traumatic (Pressure) Asphyxia"; Dr. S. Warren Reese (by invitation), (1) "A Case of Antimetropia," (2) "A Case of Ocular Motor Palsy with Unusual Manifestations"; Dr. Alfred Cowan (by invitation), "A Note Concerning a Course in Optics as Applied to Ophthalmology"; and Dr. Hunter W. Scarlett, "An Unusual Hole in the Fundus." Exhibition of Case.

On Monday evening, April 21st, at the meeting of the Section of Ophthalmology of the New York Academy of Medicine, the following cases were presented: "Osteoma of the Orbit" and "Intraorbital Foreign Body" by Dr. Arnold Knapp; "Malignant Melanoma of the Upper Lid" and "Melanosarcoma of the Limbus" by Dr. C. E. McDannald. "Sarcoma of the Right Upper Lid" by Dr. John M. Wheeler; "Teratoma of the Orbit" by Dr. W. B. Weidler; "Malignant Exophthalmic Goitre" by Dr. A. E. Davis; "Traumatic Pulsating Exophthalmos" by Ben Witt Key.

The Oxford Ophthalmological Congress will assemble at Keble College on the evening of July 2nd, and the meeting will be held on the following three days. The secretary is Dr. Bernard Cridland, Salisbury House, Wolverhampton, England. The Doyno Memorial Lecture will be delivered by Dr. T. Harrison Butler on "Focal Illumination of the Eye with Reference to the Clinical Use of Gullstrand's

Slit Lamp. A discussion will be held on "The General Principles of the Treatment of Convergent Concomitant Strabismus," to be opened by Dr. E. Landolt, of Paris, and Dr. Ernest Thomson, of Stirling. A discussion on "Medicolegal Ophthalmology" will also be held.

The meeting of the Colorado Ophthalmological Society on March 15, 1924, took the form of a dinner held at the University Club, Denver, to celebrate the twenty-fifth anniversary of the founding of the society on March 17, 1899. Dr. Edward Jackson acted as toastmaster.

Short addresses in appreciation of the value of the society to its members were made by Dr. George F. Libby as chairman of the committee on arrangements, Dr. Edward Jackson as toastmaster, Dr. Frank R. Spencer, Dr. James J. Pattee, Dr. Melville Black, and Dr. M. Jean Gale, Drs. Pattee and Black emphasizing Dr. Jackson's service to ophthalmology both thru the local society and in other ways.

Dr. Wm. M. Bane related some of his experiences while recently studying ophthalmology in Vienna and in other clinical centers of Europe.

Dr. David H. Coover gave an outline of Dr. Jackson's life and work, and in conclusion presented to Dr. Jackson as the society's founder a silver loving cup in the name of the Colorado Ophthalmological Society.

Dr. Jackson, in response, referred to the educational value of the printed reports of the meetings of local ophthalmologic societies.

MISCELLANEOUS.

Among 60,000 Ford employees examined in Detroit, 29,000 had defective vision.

The Society for the Relief of the Destitute Blind, New York, has been left \$25,000 under the will of Miss Emily Watson.

The New York Association for the Blind has been left \$76,300 under the will of Rudolph Keppler. By this same will, the New York Eye and Ear Infirmary was left \$10,000 and the New York Ophthalmic Hospital, \$5,000.

A group of ophthalmologists especially interested in the provision of ophthalmic benefits for insured persons have formed themselves into a committee in order to support the British Medical Association in any action that may be taken to secure a working arrangement for the treatment of insured persons by duly qualified ophthalmic surgeons. "Optical benefit," as it is described in the insurance regulations, is dealt with in different ways by the various approved societies, but in only one society is any satisfactory arrangement made to provide for the insured the services of competent ophthalmic sur-

geons. This is unfair to insured persons, and most serious for the future of ophthalmology in this country. A meeting to receive the report of the above mentioned committee and to consider its proposed program was held in March.—*Brit. Med. Jour.*, March 2, 1924.

As a result of the efforts of Dr. William Mackenzie, a public meeting was convened in the Town Hall, Glasgow, on the tenth of February, 1824, to consider the advisability of establishing an institution for the treatment of eye diseases. A committee was formed, with Dr. George C. Monteath as convener, to carry out the scheme, and on the seventh of June, 1824, a very quiet beginning was made in a small house at 19 Inkle Factory Lane, at the corner of North Albion street. Drs. Mackenzie and Monteath were its first surgeons. From this small beginning the Eye Infirmary entered upon its long and successful career of usefulness. The hospital was removed to David Dale's house in Charlotte street in 1851, and later the directors decided to build on the present site at Berkeley street. The new buildings were opened on April 27, 1874. The premises at Charlotte street were retained as an out-patient department for the east end of the city. A special committee is at present considering the means to be adopted for the suitable celebration of the centenary.

The following assignments of ophthalmologists to the hospitals of Paris have been made:

Hôtel Dieu: Surgeon, De Lapersonne; assistant, Cousin; alternate, Chapuis; chief of clinic, Prêlat; assistant chief of clinic, Gautrand.

Hôpital de la Pitié: Ophthalmologist, Monthus; alternate, Chatellier; externes, Ledoux, Amiot.

Hôpital Necker: Assistant, Cantonnet; alternate, Joltrois; externes, Fontaine, Denis.

Hôpital Beaujon: Ophthalmologist, Terrien; assistant Goulfier; alternates, Dognon, Barny, Ronamet; externes, Denneil, Chevalier, Bourlouton.

Hôpital Lariboisière: Ophthalmologist, Morax; assistant, Merigot de Treigny; internes, Vialère-Vialex, Veil; externes, Josand, Marq, Michaud, Schrameck, Isnel.

Hôpital Laennec: Ophthalmologist, Rochon-Duvigneaud; assistant, Bénard; interne, Castéran; externes, Allaire, Bouron, Baudrillart.

Hôpital Saint-Louis: Ophthalmologist, Dupuy-Dutemps; assistant, Charpentier; interne, Favory; externes Agnis, Delotte.

Hôpital des Enfants-Malades: Ophthalmologist, Poulard; assistant, Lavat; interne, Renard; externes, Boyer, Josset, Camps, Artigues.

Hôpital Trousseau: Assistant, Cerise; externe, Medioni.

Current Literature

These are the titles of papers bearing on ophthalmology. They are given in English, some modified to indicate more clearly their subjects. They are grouped under appropriate heads, and in each group arranged alphabetically, usually by the author's name in **heavy-faced type**. The abbreviations mean: (Ill.) illustrated; (Pl.) plates; (Col Pl.) colored plates. Abst. shows it is an abstract of the original article. (Bibl.) means bibliography and (Dis.) discussion published with a paper. Under repeated titles are given additional references to papers already noticed. To secure early mention, copies of papers or reprints should be sent to American Journal of Ophthalmology, 217 Imperial Building, Denver, Colorado.

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